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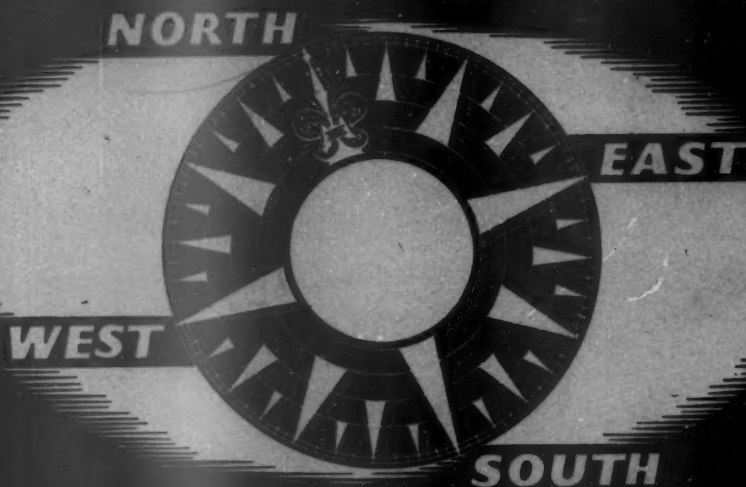
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## Disunity in the Unions

THE decision taken in principle last Monday by the engineering unions to accept an increase of 11s. a week for their members, with an undertaking not to ask for a further increase for 12 months, and the failure of the shipbuilding trade unions to follow the same course, may well mark a serious division between member unions of the Confederation of Shipbuilding & Engineering Unions. Some 3,000,000 engineering employees will be affected directly or indirectly by the increases of 11s. a week to skilled men, 9s. to unskilled, and 10s. to intermediate grades. The cost to employers, who have already agreed to the increases, is likely to be some £65,000,000 a year. The shipbuilding unions, who have had an offer from employers identical with that made by the engineering employers, have not accepted, and it seems that they will press for the highest increase which the managements can be persuaded to give unconditionally. The decision of the Confederation in respect of engineering pay was taken on a card vote which showed 641,000 in favour and 526,339 against, so that evidently there is a deep division of feeling. The year's standstill in engineering wages will be welcomed by British Railways, which will be able to forecast the cost of equipment with more precision, and also by manufacturers of railway material, who will be

helped to quote firm prices for export, although other factors than wages are necessarily involved. The extent of disunity among the railway trade unions was shown at Folkestone on Monday, when Mr. W. J. P. Webber, General Secretary of the Transport Salaried Staffs' Association, told the Association conference that the National Union of Railwaymen is an industrial union which "will never give up that industrial organisation" and will not subscribe to demarcation. He was opposing a resolution deploring disunity among the three railway trade unions and urging the establishment of closer relations between them. The railway unions, commendably, have given their support to productivity measures on the railways. It is everyone's loss that they continue to wrangle over some matters. The difference is essentially one between a union, the N.U.R., claiming to represent an industry as a whole, and two unions, the T.S.S.A. and the Associated Society of Locomotive Engineers & Firemen, representing members with particular skills and fearing that their especial interests would not receive the attention due to them if merged in a comprehensive trade union.

## Combustion Engine Congress

THE annual general meeting of supporters of the British National Committee of the International Congress on Combustion Engines, which this year will be held at Zürich between June 17 and 22, took place at Brown's Hotel, London, W.1, on May 15. Mr. W. K. G. Allen, who presided, gave an encouraging report of the work put in by the British Committee and stated that the number of British delegates attending the Zürich meeting will be slightly larger than that which went to The Hague two years ago. A party of over 150 is expected, and this will be among, if not actually, the largest national body present. He was clearly expressing the view of the meeting when he paid a tribute to Mr. Malcolm Logan and Mr. K. H. Higgins for the work they had done during the year on behalf of the British National Committee, and at the special request of the meeting he thanked the British Internal Combustion Engine Manufacturers' Association for making staff available for this work. He also stressed the importance of the organisation from the viewpoint not only of the industry, but also of the nation. On the motion of Mr. Julian Tritton, carried with acclamation, Mr. Allen accepted the renewal of his Chairmanship of the British National Committee for a further year.

## The End of Petrol Rationing

WITH the abolition of petrol rationing last week, British Railways have lost the last advantages they enjoyed over road transport in the period of fuel restrictions. Road hauliers and public service vehicle operators, in effect, have received all the fuel they needed in recent weeks, and private motorists, who have accounted for much of the extra passenger traffic by rail in the last few months, are now in the same position. It is probable that many of those who have been renewing their acquaintance with rail travel will have been sufficiently impressed to continue to use the railways instead of their motorcars for at least some journeys. London Transport, as Sir John Elliot, its Chairman, made clear last week, is urging business travellers to leave their motorcars at station car parks and continue their journeys into London by public transport. The suburban services of British Railways and the London Transport railways have shown that they can deal with the extra traffic concerned, and the London streets, instead of becoming, in Sir John Elliot's words, a "busman's nightmare," would be all the clearer for buses—to be more closely supervised as to running in future—and those who must use motorcars in London.

## Two Hundred Railcars from Metro-Cammell

IN our issue of December 7, 1956, we commented on the progress made by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., in making regular deliveries of diesel multiple-unit vehicles to British Railways from its Salford



Works; at that time the company had completed 100 vehicles: 14 for the Bury-Bacup service of the London Midland, 58 to the Norwich area of the Eastern, and 28 for the Newcastle-Carlisle service of the North Eastern Region. Since then deliveries have been continuing steadily and the company now has delivered its 200th vehicle of this type. Of the second 100, 10 two-car sets have gone to the West Riding, four two-car sets to the Manchester area, 13 four-car sets and 12 two-car sets for services in the Darlington area. Metro-Cammell recently was awarded a further contract for 160 railcars for British Railways for delivery by the end of 1958. This brings the quantity on order up to 571—eloquent testimony to efficiency in production and quality of output.

### North Eastern Region Traffic Organisation

THE division of the North Eastern Region of British Railways into four areas, under the general supervision of the Chief Traffic Manager, Mr. Frank Grundy, and each under its own Traffic Manager, who will co-ordinate the traffic functions of the Commercial, Operating, and Motive Power Departments, resembles generally in intention that of the Eastern Region on which we commented in our March 8 issue. The railway geography of the four North Eastern Region areas is very different; whereas the Eastern Region could be divided with relatively less difficulty along natural "lines of cleavage" (the former G.N.R., G.E.R., and L.T.S.R.) the North Eastern Region—a single railway system before grouping in 1923, and a single Area of the L.N.E.R. from then until nationalisation—cannot be divided so readily for operating purposes. The areas will be: Tyne & Wear, with headquarters at Newcastle; Tees-side, with headquarters at Darlington; West Riding, with headquarters at Leeds; and Hull & York, with headquarters at Hull—away from Regional headquarters at York. The names of the new Area Traffic Managers are given in our personal columns. Full details of the new organisation have not, it seems, been worked out, but it appears to suffer from the same disadvantages as does that of the Eastern Region.

### Overseas Railway Traffics

SOUTH African Railways & Harbours railway receipts were £2,686,018 in the week ended February 2, 1957, compared with £2,601,555 in the corresponding week of 1956. This tendency to rise above the 1956 figures continued, and only during the week ended March 16, in the eight weeks to the end of the financial year, on March 31, did they fall below the 1956 figures. The year closed with total receipts of £137,907,255 compared with £137,390,939 in 1955-56, so that the average weekly receipts for 1956-57 were £9,930 better than in 1955-56. Salvador Railway Company receipts for March were colones 281,000, compared with colones 251,000 last year; the aggregates for the nine months July-March of 1956-57 and 1955-56 were respectively colones 2,474,000 and 2,177,000. Canadian Pacific revenues for March were \$43,933,538 (against \$40,643,776 for March, 1956) and railway expenses \$38,704,565 (\$36,627,466) so that net earnings were \$5,228,973 (\$4,016,310). This brought the aggregate net earnings from January 1, to \$2,463,190 compared with a deficit of \$2,765,783 for the previous two months.

### East African Affairs Explained

A SERIES of five articles by Sir Arthur Kirby, General Manager of the East African Railways & Harbours, published recently in *The East African Standard*, is designed to give his readers—and must surely have succeeded—a fuller conception of the working, progress, and plans of the Railways & Harbours Administration. The author makes a strong case for the expenditure of money and materials in his administration's development programme for the next decade, and this exposition of plans must be of particular interest to industry. Referring to

finance, Sir Arthur Kirby has emphasised that E.A.R. & H. are run "on strict business lines"—and with very little East African money invested in the undertaking. In endeavouring to keep overheads to a minimum, he points out, his administration for some time has implemented a policy of ploughing back revenue by way of betterment funds. In explaining the facts behind increases in rail and port rates, he has drawn an excellent parallel with private business in justifying increases in keeping with the ever-increasing cost of equipment and labour, and makes it abundantly clear that the Railways & Harbours have an essential part to play in the development of East Africa, and that their management is fully alive to its responsibility to the communities served, and knows well how to discharge it.

### Electric Locomotives for the Southern Region

WE speculated in our issue of May 10 as to the extent to which the Southern Region would use electric locomotives on the extension of its third-rail electrification south-eastwards into Kent. We are now informed that 13 2,500-h.p. electric locomotives are to be built at the Doncaster Works of British Railways, Eastern Region, with equipments supplied largely by the English Electric Co. Ltd., for Phase 1 of the East Kent Coast electrification at 750 V. d.c. and a further 11 similar locomotives are planned for Phase 2. They will use a motor generator system similar to that of the three units in the Central Section, to avoid difficulty in negotiating lengthy gaps in the live rail. It is proposed to use them for haulage of passenger trains such as the "Golden Arrow" and the "Night Ferry" and for freight haulage where possible. Also included in Phase 1 are 45 1,500-h.p. diesel-electric locomotives and a further 53 are planned for Phase 2; these locomotives will be used mainly for freight work and for certain other trains to work in routes and yards not equipped with the live rail.

### A Welcome to Railway Service

THE new edition of "British Railways Welcome You," a booklet which has been handed to newcomers to railway service since 1950, is in many ways a great improvement on the old. It adopts a rather more serious attitude—earning one's living is, after all, a serious business—without being over-complicated and, in conjunction with the special leaflets available describing particular types of work, should give the new entrant a very good general picture of the great organisation he or she has joined. The illustrations are well chosen and well-reproduced, and the inclusion of a system map is a reminder to the young railwayman that, no matter how localised his own work may be, he is part of a team working in every district of the country—a point which many older railwaymen tend to forget. This implicit insistence that a man is a railwayman first and a goods porter, signalman, or stores issuer afterwards is all to the good. There is a foreword by Sir Brian Robertson, Chairman of the British Transport Commission, which deserves to be read by all railway staff, for it tells the new entrant that "it is up to you to learn all you can about the business of running a railway"—not, it will be noticed, just his own individual job.

### 17 Railway Group at Longmoor

AN important change has taken place in the constitution of 17 Railway Group, Army Emergency Reserve, Royal Engineers (Transportation Branch), which has recently completed its annual camp at the Railway Training Centre at Longmoor. The former 18, 19, and 60 Railway Groups have been fused into a new 17 Railway Group; this is in accordance with the current national defence policy, but at the same time it reintroduces the former close association between the squadrons of the Group and the prewar railway companies—now represented by the British Railways Regions which have succeeded them. This change will doubtless promote



keen and healthy rivalry within the Group and an added pride in the individual squadrons, and promote recruitment of reservists, so necessary now that national service A.E.R. personnel need not attend an annual camp. On a visit to Longmoor last week several changes were apparent: recently some of the older steam locomotives of the Longmoor Military Railway have been disposed of; although the total number of locomotives has decreased, there are more diesels now, including two 275-h.p. diesel-hydraulic locomotives, built by North British Locomotive Co. Ltd., with National engines. Doubling of the track—excellent training for the constructional units concerned—has been completed on a section of the Longmoor Military Railway.

### Diesel Operation of Steelworks Railway

A VISIT last week to the Margam plant, near Port Talbot, of the Steel Company of Wales Limited, enabled us to see something of the operation of the diesel-electric shunting locomotives in the works. A brief description is given on another page. The economies realised through use of diesel motive power for this kind of work are striking. The company uses both steam and diesel-electric locomotives in the plant, and is, therefore, in a position to make reasonably fair comparisons. The average saving in operation through use of diesel locomotives is about 10s. per engine-hr. A saving of this order has already been claimed on other occasions in similar operating conditions; but it must be borne in mind that the motive power at Margam is worked intensively and that the diesel locomotive maintenance facilities there are perhaps the best of their kind in the country. Both these factors are essential for obtaining maximum efficiency with diesel traction.

### New Signalling at Cowlairst

THE new signalling at Cowlairst, Glasgow, brought into use a short while ago and described in this issue, affords another example of the benefits to be obtained by bringing the operation of areas in which there are several junction connections under a centralised control and eliminating the considerable amount of message transmission work unavoidable with older methods and consuming so much time. "With the clearer overall picture now obtainable it becomes possible to take quicker decisions and thus direct traffic movements to the greatest possible advantage, as has been well demonstrated already in installations of similar type. The equipment at Cowlairst incorporates the latest advances in apparatus of this class and is, of course, worked on the route setting principle, which has given ample proof of its usefulness elsewhere and offers particular advantages in layouts of the form found at this place, located on the important Glasgow-Edinburgh main line and handling traffic of all classes.

### The Ruston Centenary

THE development of Ruston & Hornsby Limited from its beginnings on January 1, 1857, when Joseph Ruston entered into partnership in a millwright's business at Lincoln, previously Proctor & Burton—as the result of a hairdresser's whispered advice—and, largely through the impetus supplied by Ruston in early days in ploughing back profits—to the great organisation which today employs 9,000 people at three large centres at Lincoln, Grantham, and Colchester, is a story of great interest, not least from the technical point of view. The social and economic progress, however, often made against formidable odds, is an aspect which cannot fail to absorb anyone concerned with industry on a large scale. The story is told with skill and insight by Mr. Bernard Newman in the illustrated volume "One Hundred Years of Good Company" brought out by the firm to celebrate its centenary.

Both Ruston, Proctor, which succeeded, in the same year,

the original Ruston, Proctor & Burton partnership, and Richard Hornsby—the two firms amalgamated in 1918—began in very insignificant circumstances as the makers of agricultural implements and both continued on parallel lines until the merger. The development of steam power for the land and industry followed shortly and each firm specialised in additional lines—Ruston, Proctor on steam excavators and Richard Hornsby on portable steam engines. Historically, the most important event from the engineering point of view is the fact that the organisation produced the world's first commercially successful oil engine, the Akroyd-Stuart design manufactured as the Hornsby-Akroyd in 1892, so preceding the introduction of the diesel engine by some years. This engine was a horizontal hot-bulb prime mover of 11 in. bore  $\times$  15 in. stroke, which produced  $9\frac{1}{2}$  b.h.p. at 200 r.p.m.; it was immediately successful and established the considerable trade in horizontal engines enjoyed by the company even today. Subsequent work on oil engines by the firm was marked by the very early introduction of vertical and cold-starting engines, and the adoption of the pressure-charged unit in the 1920s, when this method of increasing power was still regarded with some suspicion.

The company has been a pioneer in other directions. The internal combustion engine Certificate No. 1 was issued in 1939, approving the first British diesel locomotive, fitted with exhaust conditioner and flametrap, allowed to operate underground in gassy conditions. In 1951, Ruston & Hornsby introduced series production of a standard gas turbine, two of which are the first in the world to operate on coal tar fuel.

From the railway point of view, the most interesting chapter is one which deals with some of the many locomotives which have been built. The tradition of quality is exemplified by three Ruston steam locomotives which were supplied to the former Great Eastern Railway in 1868, being finally withdrawn from service only as late as 1950-52. The construction of diesel-powered locomotives dates from 1900, when Richard Hornsby Limited built a unit of 20 h.p., the progenitor of a long line of diesel locomotives built for a diversity of operations, both of industry and climate, often powered by products of the company's Colchester associates, Davey Paxman Limited, acquired in 1940.

A glance at the index shows the wide diversity of products and their applications for which the company has been or is now responsible. An important new development is the research centre briefly described in our last week's issue. The author rightly suggests that Joseph Ruston would be a proud man if he could return today to see what has developed in a century from his first venture.

### Staff Training in East Africa

UNTIL recently, most of the supervisors and skilled workers employed by the East African Railways & Harbours came either from Great Britain, India, or South Africa. The improved standard of local education, however, and the difficulty of recruiting staff from overseas has led to the development of training schemes within the railway administration to train Europeans, Asians, and Africans for a wide variety of occupations. The schemes have been devised to cater for recruits of varying educational standards but they are operated on an entirely non-racial basis. Equal opportunities for recruitment and advancement in the service exist for all races. Trainees for senior supervisory and technical posts must possess a Higher School Certificate or equivalent, while for posts of an intermediate level of responsibility they are accepted with the School Certificate qualification. For entry at the lowest point on the clerical, artisan, and footplate staff scales, a certification of completion of primary school education is required. A few cadetships are awarded annually to university graduates and men with professional qualifications, for training for senior officer posts.

The E.A.R. & H. training schemes cover the whole field

of railway employment. In the Mechanical Department a fully developed apprenticeship scheme is in force for the training of artisans, while in the footplate grades, trainee drivers are recruited for a five-year course of training; there is a two-year training course for permanent way staff in the Engineering Department; and for traffic staff various courses are held for the training of station clerks, telegraphists, assistant station masters, and so on. These courses are conducted in the railway administration training schools, of which the latest to be opened is the new Railway Training School at Nairobi, built at a cost of some £400,000. In addition, facilities are provided for the training on the job of men such as draughtsmen, surveyors, road motor mechanics, and marine engineering artisans.

In the training of staff in the junior training grades, part of the curriculum is devoted to general education in subjects such as English, arithmetic, geography, and physics. Some 95 per cent of these trainees are Africans whose background is that of a comparatively primitive village and tribal life. They are being trained to obtain their livelihood in an industrial society, and have to adjust themselves to a complete change in their way of life. For this reason the railway management places great emphasis on the need for social training. All the training schools are residential, and the activities of the students are carefully organised to inculcate self-reliance, industry, and ability to co-operate with others. Good recreational facilities are provided and a healthy spirit of competition amongst the students is encouraged in organised games and other pastimes. The training policy of the E.A.R. & H. has a two-fold aim: to produce good citizens and to train men for their respective railway occupations.

### Summer Timetables, E. and N.E. Regions

**T**HE duplication of the "Talisman" service between London and Edinburgh is important from both the business and the tourist point of view. The new down "Morning Talisman," leaving Kings Cross at 7.45 a.m., will get the passenger to Newcastle by 12.19 p.m., 25 min. earlier than the present 7.50 a.m. down, and to Edinburgh by 2.30 p.m. Any passengers proceeding further will be able to reach Glasgow by 4.1 p.m., and even though a wait of 90 min. will be involved, the 4 p.m. from Edinburgh to Perth will, for the first time on record, make it possible to reach principal stations on the Highland line, including Inverness (9.40 p.m.) from London without night travel, though it is a pity that the "Morning Talisman" will miss the 2.15 p.m. from Edinburgh to Dundee and Aberdeen by no more than 15 min. While the main portion of the 7.50 a.m. from Kings Cross will still run to Newcastle, it will call at York (11.21 a.m.) to give connection to Darlington (12.13 p.m.), but will then be diverted to the coast route, reaching Stockton-on-Tees at 12.13 p.m. and West Hartlepool at 12.34 p.m. (44 and 41 min. acceleration) and Sunderland at 1.2 p.m.

In the reverse direction the "Morning Talisman" will start from Edinburgh at 7.30 a.m. and will leave Newcastle at 9.45 a.m., thereby competing heavily with the 9.20 a.m. "Tees-Tyne Pullman," as the former's Kings Cross arrival at 2.15 p.m. will be only 13 min. after the latter's 2.2 p.m. This somewhat resembles the evening conditions also, when the 6.15 p.m. "Evening Talisman" from Newcastle, Kings Cross 10.45 p.m., will be only 32 min. behind the 5.3 p.m. up (the return working of the 7.50 a.m. down), while the "Heart of Midlothian" (4.32 from Newcastle) will arrive no more than 18 min. in advance of the 5.3 p.m. In the circumstances the 5.3 p.m. also might well travel south from Newcastle via the coast route, giving the same advantage in time to West Hartlepool and Stockton-on-Tees passengers for London as the down train; Darlington is well served by the up "Heart of Midlothian."

The progressive deceleration of expresses using the main line between Kings Cross and Doncaster continues, and from June 17 a further addition, ranging mostly from

4 to 9 min., will be made; the 12.20 p.m. "Northumbrian" and 3.40 p.m. "West Riding" will both be slowed by 9 min., and the 8.50 a.m. "White Rose" by 7 min. The 10.10 a.m. down will be 8 min. later into Edinburgh than last summer. In the up direction there will be similar decelerations, the worst being 23 min. in the case of the 10.10 a.m. from Edinburgh (with an extra stop at Grantham), 12 min. with the up "Northumbrian" (leaving Newcastle at 10.5 instead of 10 a.m.), and 9 min. with the up "Queen of Scots." This summer the "Elizabethan" will be allowed 6 hr. 35 min. in each direction for the non-stop run of 392.9 miles between Kings Cross and Edinburgh, and so will fall just below the 60 m.p.h. average; the same will apply to all four "Talisman" workings between London and Newcastle, increased to 4 hr. 33 min. down and 4 hr. 30 min. up for the 268.4 miles; while the "Flying Scotsman" summer time between London and Edinburgh will be increased from 7 hr. to 7 hr. 5 min. each way.

Among other changes the 8.20 a.m. from Kings Cross to Hull, which last summer started at 7.55 a.m., this year will leave at 8.5 a.m., omit the Hitchin stop but call additionally at Huntingdon, and take 10 min. longer on its journey. There will be a new train from Newcastle at 9.15 a.m. to Edinburgh and from Edinburgh at 6.30 p.m. to Newcastle, calling at principal stations. The 12.5 p.m. relief from Newcastle to Kings Cross will run daily. An important addition to the Sunday services will be a new 2.15 p.m. express from Kings Cross to Edinburgh, calling only at York and Newcastle, and completing the journey in 7 hr. 10 min., which is 32 min. quicker than the weekday 2 p.m. "Heart of Midlothian"; the corresponding up express will leave Edinburgh at 1.5 p.m. and be fast to York in 3 hr. 52 min. with an 80 min. run over the 80.2 miles from Newcastle, but 19 min. slower than the down train from York to Kings Cross, arriving at 8.48 p.m. The very frequent even-interval service of last summer from Kings Cross to Leeds, Newcastle and Edinburgh and vice versa will be reintroduced in identical form, with certain additions, including a new 8.20 a.m. from Hitchin to Scarborough and an 11.30 a.m. from Peterborough to Edinburgh both making principal stops.

In the Great Eastern Section all trains between Liverpool Street and Clacton will have 3 min. added to their schedules between Colchester and Clacton because of engineering work on the electrification. The "Day Continental" from Liverpool Street to Parkstone Quay will start at 9.5 instead of 9.33 a.m. On Sunday evenings the 7.54 p.m. from Liverpool Street to Ely will call additionally at Broxbourne and Harlow, and the 8.29 p.m. from Liverpool Street to Kings Lynn will start at 8.54 p.m.

### Conveyors for Tunnel Spoil Removal

**R**AILWAY civil engineering has at its disposal today a wide variety of power appliances and labour-saving methods developed primarily for general industrial purposes. Typical examples of how they are being applied are the use of conveyors on the German Federal Railway for spoil removal in opening out a tunnel, to which we referred in our issue of October 26, 1956, and the conveyor system to be adopted on British Railways for tunnel construction on the Greenwood-Potters Bar widening of the Eastern Region main line from Kings Cross (see our May 3 issue).

The latter plant was designed by the Fraser & Chalmers Engineering Works of the General Electric Co. Ltd., to the requirements of the civil engineering contractor, Charles Brand & Son Ltd., and consists of conveyors for taking the spoil from the digging shield and loading it into trains of 2-cu. yd. capacity wagons hauled by diesel locomotives running on a 2-ft. gauge track which take the spoil from the tunnel. Men working in the 12 compartments of the tunnelling shield shovel spoil into a chute delivering on to a retractable conveyor, which in turn

feeds on to an inclined conveyor from the top of which the spoil is discharged into a hopper and then into wagons for removal from the tunnel. Two tracks are laid on the conveyor platform, these tracks being cross-connected by a power-operated traverser to transfer wagons from the "empty" to the "full" track so that a continuous supply of empty wagons can pass below the loading hopper without interruptions for shunting. The same tracks are used for transporting the concrete blocks for the tunnel lining to the face.

By retracting the front section of the conveyor, space is left for constructing the lower part of the tunnel lining. The conveyor installation is attached to the shield and moves forward with it. Although on average the rate of excavation is low in comparison with the continuous capacity of the conveyors employed, the system has been designed to deal with the very high short-term rates of loading which can occur in this type of work. The advantage in adopting a conveyor system for the removal of spoil from the working face lies in the fact that continuous operation is assured, the only manual work involved being the loading of the spoil into the feed chute apertures in the shield.

### Record Year in Nigeria

**T**HE year 1956 was one of steady increase in the efficiency and development of the Nigerian Railway. During the 12 months ended December 31, 1956, more than 7,250,000 passengers were carried, the figure of nearly 740,000 in December constituting a record. In the same period 2,809,000 tons of goods traffic, of which 2,072,000 were revenue-producing, were handled. The average length of haul per paying ton was 529 miles. The 1955-56 groundnut season ended on November 11, 1956, when 438,515 tons of Nigerian nuts, 64,894 tons of cake and oil, and 68,023 tons of French nuts had been railed to Apapa and Port Harcourt. The total of some 571,000 tons was a record for any season. Receipts from these activities amounted to £1,859,000 from passenger business and £12,109,000 from goods. Corresponding operating expenditure totalled £11,623,000, giving an operating ratio of expenditure to receipts of 83 per cent. Several monthly operating records were broken during the year. These included an average net freight train load of 270 tons in August and an average gross train load of 540 tons, net freight ton miles for that month reaching 124,329,000.

On February 11, the Queen and the Duke of Edinburgh travelled by Royal Train from Lagos Terminus to Ibadan. During the Royal visit, 49 special trains were run carrying 26,300 passengers and 3,300 passengers travelled by special arrangements on ordinary trains. For the Durbar held at Kaduna the railway transported 250 horses from loading points over a wide area and took them back again after the celebrations were over. In the new timetable, which applied from July 1, 1956, the time of the limited trains between Lagos and Kano was cut from 37 hr. 10 min. to 35½ hr., and since January 1, 1957, there has been a further reduction to 34 hr. 10 min. with corresponding reductions in the times of other limited trains. New third class coaches were introduced on these services during the year, releasing upholstered stock for ordinary passenger trains which have also been equipped with new first and second class composite day coaches. Additional upper class sleeping and dining cars are expected from the United Kingdom during the current year.

The signalling system is gradually being modernised and standardised and two new schemes were brought into operation at Kano South and Ibadan North. A similar scheme for Ibadan South will be completed this year. The double-wire method of interlocked signalling will eventually be introduced all over the line with points and signals at wayside stations operated from a raised signal-frame or cabin. Work is in hand on the installation of signalling at the stations between Kafanchan and Enugu. The original Tyers electric train staff instruments are being replaced by the more modern key token machines between Lagos and Ibadan; and work has already been

carried out as far as Abeokuta. Several new crossing stations were completed during the year to facilitate train working by the shortening of sections, and some of them may eventually become traffic stations for the handling of passengers and goods. To improve the Nigerian Railway Corporation telecommunication facilities a new radio station was opened at Jebba, and during 1957 a similar station will be brought into service at Kafanchan. The telephone train control was extended from Ibadan to Jebba and will be applied to the Zaria-Kano section later this year.

The last of the new 750-h.p. Bo-Bo diesel-electric locomotives was placed in service in January, 1956, completing the total order of 10 locomotives. During the year the operation of these locomotives was extended to working all trains on the Zaria-Kano section and on the Zaria-Kaura Namoda section. The workshops and running sheds to maintain and service these locomotives were completed at Zaria during 1956, with the exception of the installation of minor items of equipment. The performance of the locomotives has been generally satisfactory for a completely new venture, and the average figure of 217 miles per engine in use per day during 1956 is good. With their quick turn-round these locomotives proved a great asset in helping to move the record volume of traffic during the year.

New running sheds at Minna and Port Harcourt were opened during 1956 and it is expected that they will materially improve the mechanical maintenance of steam locomotives during 1957. The performance of main-line steam power showed a marked improvement in respect of engine failures which amounted to 179 for an average of 41,568 miles per engine failure. Six "51" class shunting engines, introduced towards the end of 1955, assisted considerably in the efficient movement of traffic in marshalling yards at Apapa Quays, Kano, Jebba, and Kafanchan. These shunting engines carry sufficient coal and water to remain in service for 24 hr. This is a great improvement on the standard type of shunting engine, which requires much more frequent servicing.

An interesting conversion of the "806" class engines from three cylinders to two cylinders was completed by the Chief Mechanical Engineer during 1956 and it is expected that the two engines will be ready for service during 1957, mainly for hauling limited trains between Lagos and Offa.

Further diesel services are proposed and four twin-railcar sets for passenger traffic and four diesel-hydraulic shunting locomotives are to be ordered in 1957. Prospects for 1957 are reasonably good, although the groundnut crop, the main source of revenue, will be substantially smaller than in the previous season. Passenger traffic, however, is tending to rise.

### Service Frequency on Urban Railways

(By a correspondent)

**I**T is well appreciated that the useful capacity of a rapid-transit railway in passengers per hour per track, is a maximum if the longest possible trains are operated as frequently as possible, and if these trains are of the highest possible performance, i.e., have the maximum possible acceleration and deceleration. Capacities of 40,000 passengers per hour per track can be obtained when attention is paid to all these points.

A problem arises when it is possible to run longer trains, but when the longer trains have appreciably poorer performance (in acceleration) than the shorter ones. Some reduction in service frequency then becomes necessary: will this more than counterbalance the increased train length? The extreme numerical study which follows, based on different applications of existing rolling stock, gives the slightly surprising result that an increase in train length of 12.5 per cent, causing a reduction in acceleration of as much as 28 per cent, enables the passenger capacity of a track to be increased by 7 per cent.

There is thus a strong case for "longer trains and fewer



of them"—to parody a *Railway Gazette* theme of some years ago—as a means of obtaining maximum capacity on rapid transit lines.

With the imminence of new rolling stock on the Piccadilly Line of London Transport, transfer of some pre-1931 tube cars to the Central Line will be possible. Consideration is given below to the use of extra trailer cars to increase Central Line seven-car to nine-car trains, albeit with only three motor coaches, rather than the use of extra motor coaches to add to seven-car trains to give more of the four-motor coach, eight-car trains which are now running. Since most, if not all, Central Line platforms are over 400 ft. long, and since the doors of the Bo-2 motor coaches in use are about 30 ft. from the driving ends, an eight-car platform will certainly accept all the doors of a nine-car train: providing the station berth track circuits are over 450 ft. long, operation of nine-car trains is thus physically possible.

The critical factor is the time of occupation of the station berth, assumed 450 ft. long. An eight-car train with a mean deceleration of 3 ft./sec.<sup>2</sup> takes 16.9 sec. to enter the station and run the 425 ft. to the centre of the berth. (The usual " $t = \sqrt{(2s/a)}$ " formula is used.) With a mean acceleration of 2 ft./sec.<sup>2</sup> the train takes 20.8 sec. to leave the berth. An eight-car train has four 30-ton motor coaches with 20 tons on their driving wheels, and four 20-ton trailers: it thus has 0.4 of its weight on the driving wheels. A nine-car train with three motor coaches would have 0.286 of its weight on the driving wheels: its mean acceleration would thus be  $2 \times 0.286/0.4$  or 1.43 ft./sec.<sup>2</sup>. Its entering time with the same mean deceleration as an eight-car train, but with a 450-ft. run, is 17.3 sec., and its leaving time for the same run, at the lower acceleration of 1.43 ft./sec.<sup>2</sup>, is 25.1 sec. The eight-car train thus has an inherent berth occupation time of 4.7 sec. less than the nine-car train of lower acceleration, assuming the same stopping time for each.

As trains are operated at about 90-sec. intervals, they will now be operated at 94.7-sec. intervals, so the service frequency will be 90/94.7, or 95 per cent of what it was. The maximum line capacity in cars per hour will thus increase from  $40 \times 8$ , or 320, to  $0.95 \times 40 \times 9$ , or 343, an increase of 7 per cent.

Further interesting considerations arise from the use of the rolling stock under discussion. Since motor coaches have one 5½-ft. doorway, and trailers two of 4½ ft., the four-motor eight-car train will have a door/length ratio of 14.5 per cent; a three-motor, nine-car train, 15.7 per cent. Assuming the normal 30-sec. stop to apply to an eight-car train, a nine-car might have a stopping time of  $(14.5/15.7) \times 30$  sec., or 27.7 sec., because of its relatively greater door service. This saving of 2.3 sec. partly offsets the loss of 4.7 sec. from poor performance and greater length: an inherent delay of only 2.4 sec. in the basic 90 sec. is thus possible. The service frequency can thus be 97.5 per cent of that for eight-car trains.

Moreover, as 30 per cent of each motor coach is occupied by driving cab and equipment compartment, a four-motor coach eight-car train has an effective length (of passenger saloon) of  $8 - 4 \times 0.3$ , or 6.8 cars, whereas a three-motor coach, nine-car train, similarly, has an effective length of 8.1 cars. The maximum line capacity in effective cars per hour is thus  $40 \times 6.8$ , or 272, with eight-car, and  $0.975 \times 40 \times 8.1$ , or 316, with nine-car trains, an increase of 16 per cent.

The above study verifies that the passenger capacity of a rapid transit line is a maximum if the longest possible trains are used; it is certainly so when train performance is independent of length, and very likely to be so even when performance is adversely affected by length. The example given has 12.5 per cent extra length, 28 per cent less acceleration, and yet 7 per cent extra capacity.

In the special conditions of the pre-1931 London Transport tube stock studied, the use of nine-car, three-motor coach trains gives up to 16 per cent more passenger flow capacity than eight-car, four-motor coach trains. It is suggested that operational research be conducted on the station performance of such a nine-car train, to see if

anything like the possible 16 per cent can be attained in practice. This might lead to the ultimate use of a group of six to ten such nine-car trains each way on the Central Line to give this 16 per cent increase from 5.30 p.m. onwards, at the congested City and West End stations, at the worst of their peak periods.

## Letters to the Editor

(The Editor is not responsible for opinions of correspondents)

### The Fuel Oil Tax

May 16

SIR,—Messrs. Hyslop, Walker, Howlett, Morton Mitchell, and Gray, writing jointly in your issue of May 10, are incorrect in inferring from my letter on page 446 of *The Railway Gazette* for April 19 that I meant that road transport does not contribute to the upkeep of the roads or that the tax on derv should be raised from 2s. 6d. to 3s. a gallon. I said nothing of the sort, nor did I mean to imply it.

What I said was that "road transport, in compensation for special taxation, enjoys the free use of some 190,000 miles of roads"—"free" meaning, of course, "unlimited." The railways, on the other hand, pay for their track themselves. Why should their diesel services pay road taxation in addition?

In regard to derv, I said: "up to the time of the emergency increase in fuel tax, road transport had for nearly five years enjoyed an unchanged rate of 2s. 6d. a gallon, despite a fall in value of money, which would be offset by an increase of 3s. a gallon, today"—meaning that inflation had reduced the real burden of this tax which had remained unchanged for nearly five years. In other words, the tax corresponding today to the 2s. 6d. tax five years ago would be 3s. Incidentally, before the war the tax was 9d., or roughly the present-day equivalent. If road transport now seeks to be relieved, will not railways also begin to look for reliefs of some kind? I assure your correspondents that the Commission are unbiased as between road and rail. They, alone in the country, are financially interested in both, and it is part of their duty to promote a balanced study of the very difficult problem of weighing the comparative burdens (including public obligation) carried by each form of surface transport in this country.

Yours faithfully,

J. H. BRENNER

Public Relations Adviser

British Transport Commission,  
222, Marylebone Road, N.W.1

### Wagon Miles per Train Engine Hour

May 20

SIR,—Your correspondent, in his article "Twelve Weeks Freight Train Traffic" on page 561 of your May 17 issue, referred to the Western Region figure of 201 wagon-miles per train engine-hour in relation to results elsewhere. This global statistic is an unfortunate choice of figure on which to base a comment of "poor return" from any one Region, for it is compounded of contradictory elements of movement, proportions of different classes of traffic and wagon user, and falls with higher average wagon loadings.

A fitted perishable freight train, with lightly loaded wagons of market produce, will show a much greater number of wagon-miles per train engine-hour than a double-headed or banked mineral train of high capacity wagons travelling slowly over difficult gradients—and a train of empties, not directly producing any revenue at all, may well show the highest figure of all!

Yours faithfully,

B. Y. W.

Gunnersbury Park

## THE SCRAP HEAP

### Flying Plate

Unwrapped, and with the address written on it in ink, a plate has been returned by airmail to Ashford (Kent) railway station buffet from Malta. It was taken out of the buffet by a soldier who bought refreshments some months ago. The Post Office added a postscript to the address: "Ninepence to pay." The stamps stuck on the plate were not enough to cover the cost of its journey.—From the "Evening Standard."

### Dream Railways

The more I travel by train the more I get mysterious hints that there is another system altogether, unknown to most of us. We all think of railway lines as radiating from or converging on London; but have you ever noticed that whatever the direction from which you approach London, about five miles from Victoria and Euston or wherever you are going, a line forks mysteriously off, or you cross over a huge set of eight tracks, disappearing round a bend behind some enormous water-cooling towers or a block of Victorian flats, black against the sunset. What *are* these lines, where do they go, who travels on them?

As I say, I have had hints. I have actually been on a peculiar line that starts from Broad Street, ploughs under Hampstead Heath, goes through unexpected stations like Kensal Rise and Willesden, and finishes, guess where? At Kew; at least that is where I went on it. It had carriages like the saloon bars of Victorian pubs, with mahogany and glass partitions; it waited at high old wooden stations where nobody got on.

At one of them a door marked "Gentlemen" opened on to a 40-ft. drop. There were tin advertisements for forgotten Victorian laxatives. And then there are the mysterious steam trains that are heard, late at night, puffing on lines that you thought were all electric, behind the big stores in Kensington.—Paul Jennings in a B.B.C. Broadcast.

### In the Steps of the Goose

British Railways, in their endeavours to popularise their service, might do worse than copy the example of Sweden's State Railways. The success of their jubilee round-trip last year—covering the whole of Sweden, and attracting 60,000 travellers—has prompted the Swedish Railways to launch a similar scheme this summer. The idea was first conceived to celebrate the fiftieth anniversary of the publication of a well-known book—"The Wonderful Adventures of Nils," by Selma Lagerlöf. It was thought that tourists might like to follow the route which Nils covered on gooseback, and visit the places where he alighted.

... If the tourist has not too much time at his disposal he may sleep in the State Railways' ultra-modern sleeping cars at the cost of an ordinary hotel room, while the train covers long or monotonous distances.—From "The Manchester Guardian."

### Appreciation from Virginia

A scroll bearing the coat of arms of the State of Virginia has been presented to Mr. T. C. Byrom, District Passenger Manager, Liverpool Lime Street, London Midland Region, in appreciation of

British Railways' service to a party of Virginians who visited Britain last year. The presentation took place at the United States Consulate in Liverpool and was made by Mr. J. F. Stone, the Consul. The party was led by Mr. Thomas B. Stanley, Governor of Virginia, and their visit was in connection with the 350th anniversary of the founding of the State. Members of the Virginia Legislature, the oldest body of its kind in the U.S.A., accompanied Governor Stanley. British Railways provided a special train to the north of Scotland and other facilities.

### Riding to a Fall

As I often do on train journeys I began to ride in my imagination over the country parallel with the line. There is some nice hunting country between Grantham and York. The pulse of the train was pleasant. In my wandering mind I likened it to the rhythm of a well bred horse galloping. The light of day was beginning to fail when I saw in the distance a broad stream. Judging that the brook was not beyond the powers of my horse, I rode him at it.

Something hit me hard just as we took off. I felt stunned. When I tried to open my eyes I saw a series of glowing lights winking at me through the gloom. Gradually I came to. The bridge of my nose was painful. I shifted my position before rising from my seat. My left foot struck against an object on the floor of the railway carriage. It was my old bowler hat which had fallen from its precarious perch on the rack. In its falling it had hit me hard across the nose when the train pulled up in York station.—From "The Times."

### The Channel Tunnel

It seems the Channel Tunnel scheme is topical again, With its long-dreamed-of trips to France

In a subaqueous train. A good idea, many may think, But, maybe, not quite fair To those who get their divvies from The cures for *mal de mer*.

Ah, not when summer zephyrs set The wave-tops all a quiver Do we repine, or look around For someone to deliver; But when the rude north-easter breaks And spray licks round the funnel, It's then the tortured traveller sighs: "Oh, for a Channel Tunnel!"

Though stabilisers do their best Across the Straits of Dover, There comes a certain queasiness When one is half-seas over. 'Tis then the seasoned stewards keep A prophylactic handy And do a little life-saving, Assisted by Old Brandy.

O *si sic omnes!* Cling to hope; Rumour is in the air. There may yet be a future for *Chemins de fer Sous-Mer*.

A. B.

### Midland Railway Heraldry



During recent renovations of Derby Station front, the London Midland Region took the opportunity to clean the Midland wyvern, now, with clockface, floodlit in the hours of darkness

## OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

### VICTORIA

#### Closing of the Forrest Line

The line from Birregurra to Forrest, nearly 20 miles, was closed to all traffic on and after March 4. The last day of operating the weekly goods train service was February 25. Birregurra is a station on the main South Western line, through Geelong to Port Fairy, and the Birregurra-Forrest branch line has been closed to passenger traffic for many years.

#### Increased Wool Traffic

For the first six months of the present financial year, 655,692 bales of wool were carried by rail, compared with 571,392 during the same period of the previous year. This represents an increase of 14.8 per cent. Traffic from the Riverina would have been higher, but serious floods in New South Wales prevented some large woolgrowers from reaching their nearest railway stations.

### NEW ZEALAND

#### Former Railways Commission Criticised

The Railways Commission, set up in 1952 and abolished some weeks ago in favour of reversion to control by a General Manager, has been much criticised in the New Zealand Press. Several papers maintain that the Royal Com-

mission of Inquiry which investigated the railways some years ago had in mind a form of administration such as that of the Bank of New Zealand, and the State Advances Corporation, and had urged the removal of the railways from close political control; but that when the railways were put under the management of a commission, the Government did not surrender its responsibilities. Too often, it is stated, railway policies were determined by political expediency, and not as the best interests of the service might dictate.

### INDIA

#### Seat and Berth Reservation

The Railway Board, which has reviewed the arrangements in force for reservation of train accommodation, has issued comprehensive instructions to eliminate the possibilities of malpractices in reservation offices. The railways have been instructed to obtain from persons applying for reservation their full names and addresses, so that cross checks can be made and the genuineness of the entries made in the departmental registers subsequently verified.

When a request for reservation cannot be complied with, the name of the person concerned must be placed on the waiting list in strict order of priority

and a "regret slip" issued, indicating the applicant's position on the waiting list. The applicant or his representative may present the "regret slip" at the reservation office concerned at a nominated hour approximately 24 hr. before the departure of the train, and if accommodation has in the meantime become available, the reservation office would provide it in order of priority on the waiting list.

The railways have also been asked to carry out periodical test checks of reservations actually made.

### EAST AFRICA

#### Buffet Car for Western Uganda Line

A new composite buffet car was put into service on the Western Uganda Extension earlier this month. The buffet car caters for both upper and third class passengers. The upper class dining saloon has accommodation for 14 passengers at one sitting, whilst at the other end of the car the buffet-servy provides tea, cold drinks, buns, and cigarettes for third class passengers. A kitchen and pantries divide the two sections of the car, which adds considerably to the comfort of passengers travelling between Kampala and Kasese.

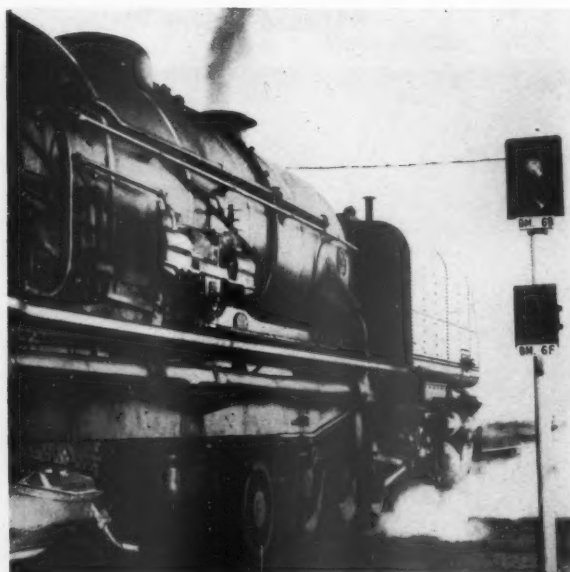
The car has been converted from an old third class coach; this work and the furnishing being carried out in Nairobi

## Centralised Traffic Control on Rhodesia Railways

(See our March 1 issue)



Installing equipment in one of the relay huts at a siding between Bulawayo and Gwelo



Beyer-Garratt locomotive leaving Bembesi Siding with train for Heany, under C.T.C. signal



at the mechanical workshops of the East African Railways and Harbours. It is broadly similar in design to an experimental car placed in service on the Nairobi-Nanyuki line last year. A number of modifications and improvements on the original design have been made, as a result of experience gained in the running of this car. A further three buffet cars are in production and will go into service on the Nairobi-Kisumu line later this year.

## ARGENTINA

### Railway Re-equipment Offer

Mr. D. A. T. van der Kooch, representing a number of Dutch firms, recently interviewed President Aramburu and made an offer to re-equip the Argentine railways over a period of 10 years, the necessary credits being granted by Holland. Dutch capital would be invested in Argentina and a number of Dutch railway experts would lend their services to the Argentine railways.

## UNITED STATES

### 558-ft. Lifting Span

The present swing span carrying the Staten Island Rapid Transit line, a Baltimore & Ohio subsidiary, across the navigable Arthur Kill to the Island,

by direction of the U.S. Army is to be replaced by a lifting span, which to allow adequately for future Army needs is to have a length of no less than 558 ft., believed to be the longest of its kind in the world. It will weigh about 2,000 tons, while the towers will incorporate just over 2,000 tons of steel, making, with the approach viaduct, a total of 4,750 tons.

The moving span will be supported by 80 2½-in. dia. wire ropes, passing over eight roller-bearing sheaves of 15-ft. dia., each designed to support a maximum load of 280 tons. The normal vertical travel of the lifting span will be 104 ft., and the time of moving it up or down 90 sec.

### Atomic Research on the Railways

Active investigation is in progress by the research laboratory of the Denver & Rio Grande Western Railroad as to ways in which atomic developments may be utilised by railways. One such possibility is self-luminous switch lamps, lights in tunnels, markers, dial illumination, and similar pieces of equipment which require permanent lighting in dark areas.

The first such application has been to a switch lamp, in which the krypton isotope 85 beta ray reacts with phosphorus to produce a self-luminous glow. This may continue for up to 10 years without maintenance or fuel, and the unit can be restored at any

time to full luminous power by refilling it with the krypton isotope gas, which is inert, so that no risks are involved in the use of the lamp.

Studies involving the application to diesel fuel of sulphur 35, a radio-active isotope, have led to the conclusion that petroleum fuels, when injected into the hot cylinder, as they are colloidal by nature, can be influenced, by control of their particle size, into yielding better combustion, with increases in power output, and a lower rate of cylinder and piston wear. The study of the behaviour of various fuels after irradiation with gamma and beta rays also offers some intriguing possibilities.

The D.R.G.W.R.R. research laboratory is now working on a fluoroscopic method of testing rail welds, the development of nuclear means of testing the soundness of materials, and the use of isotopes in material preservation.

## EASTERN GERMANY

### Couchettes Introduced

The first couchette coaches (*liegewagen*) in Eastern Germany, now under construction, are to be placed in service during the summer between Sassnitz (connecting with the ferry from and to Sweden) and Vienna via Berlin and Prague. This type of accommodation is at present limited to certain countries in Western Europe.

## Publications Received

*Survey of London, Vol. XXVI. The Parish of St. Mary, Lambeth, Part two, Southern Area.* Published for the London County Council by the Athlone Press, University of London. 11½ in. × 9 in. 226 pp. + xiv pp. + 75 pp. plates. Price 40s.—The maze of London suburban railways south of the Thames is mainly a product of the late 1850s and 1860s, and to a large extent is on viaduct. It is not surprising, therefore, that railways and railway architecture are given 49 references in the index to this volume of the Survey of London dealing with the southern area of the ancient parish of St. Mary, Lambeth, and covering parts of Kennington and Vauxhall, also South Lambeth, Stockwell, Brixton, Denmark Hill, Tulse Hill, and West Norwood. The book is an historical and descriptive account of the older public and domestic architecture. The many railway illustrations include the exterior of Herne Hill Station and the portal of Knight's Hill tunnel.

*One Hundred Years of Good Company.* By Bernard Newman. Lincoln: Ruston & Hornsby, Limited. 8½ in. × 5½ in. 272 pp. Illustrated. No price stated.—Published to mark the Ruston centenary, which falls this year, this book tells the story of the growth and development of Ruston & Hornsby, Limited, and its components, from the beginning in 1857, when Joseph Ruston entered

into partnership in a small millwright's business. Mr. Bernard Newman gives a lucid and readable account. The history of this great engineering firm is the subject of an editorial article elsewhere in this issue.

*Diesel Locomotives.* Second Edition. London: Ian Allan, Limited, in collaboration with the Internal Combustion Group of the Locomotive & Allied Manufacturers' Association of Great Britain. 11 in. × 8½ in. 39 pp. Illustrated.—This, the second edition of the publication which appeared a year ago, is designed to present the diesel locomotive in popular form. As before, the cover and centre pages are in colour, and the book has many well-produced half-tone illustrations. The three major forms of transmission are again explained briefly and in simple language.

*Nylon Goes to Work.* British Nylon Spinners Limited, of Pontypool, Mon., has published a revised edition of the illustrated booklet, "Nylon Goes to Work," describing some of the more important uses in industry for nylon textiles, ropes, and nets. The development of nylon for industrial purposes has been extremely rapid since the first edition was published two years ago. Sections are included which deal with tarpaulins, upholstery, lorry tyres, and so on. There has been extensive revision of most of the other sections dealing with subjects from filter cloths to ropes and belting. While this is

essentially a non-technical publication, it contains much useful information about nylon's properties and provides the answers to many of the fundamental queries about nylon.

*East African Locomotives.*—The brochure, the subject of a notice in our issue of October 26, 1956, which briefly describes and illustrates 12 of the best-known steam and diesel locomotives of East African Railways & Harbours, including the "59" class Beyer-Garratt locomotive, is now on sale at the East African Office, Grand Buildings, Trafalgar Square, London, W.C.2. It has been necessary to modify the production slightly, and the illustrations are no longer in postcard form.

*A.B.C. Coach & Bus Guide: Summer Services, 1957.*—In the improved and enlarged form adopted last year (see our issue of April 27, 1956), this twice-yearly timetable provides a useful guide to the regular road transport services and tours in Great Britain and to the Continent, as well as combined coach-air facilities. Because of the Suez Canal emergency, the publishers waited until the fuel position became more stable before closing for press. The many maps add greatly to the utility of the volume, which totals 464 pages, and is published at 5s. by Index Publishers Limited, 69, Victoria Street, London, S.W.1. The annual subscription rate (including the summer supplement) is 10s.

## Pattern Making in Plastics

*Considerable mechanical strength and good surface finish obtained*

*By H. G. C. King,*

*Pattern Shop Foreman, Crewe Locomotive Works, London Midland Region*



*Layout of plant and equipment at Crewe Locomotive Works*

**T**HE recent introduction of plastics as a material for the manufacture of foundry patterns has opened a wide field for interesting development. Results obtained at this early stage have been so successful that the future of plastics in the pattern shop seems assured. For the last two years the possibilities of using this type of pattern in iron, steel, and brass foundries have been investigated and developed in the Crewe Locomotive Works, London Midland Region, British Railways, by the author, and considerable success is being achieved after initial difficulties and trials with various types of resins and fillers.

As the result of research, there are now several hundred patterns of this type in use with considerable success, and the claims made will illustrate the advantages that have been found to accrue from this comparatively new practice. Patterns can be produced possessing considerable mechanical strength, and with a surface finish at least equal to the best of metal patterns, and at a cost of little more than the conventional wood pattern. After use for many thousands of moulds made by a jolt squeeze machine, wear of this type of pattern is immeasurable. Plant is inexpensive, and only a small outlay is necessary in the first place.

### Materials and Equipment

The plastic consists of a synthetic resin known as Epoxy resin type Epophen, which is supplied in syrup form, a filler, which may be calcium carbonate, powdered slate, and so on, and a hardening agent, the addition of

which transforms the syrup into a solid. In addition, scales to weigh up to 14 lb., an assortment of Pyrex mixing vessels of one pint to two quart capacity, and rubber gloves, together with a suitable barrier cream to give protection during mixing, are required for initial developments. A simple oven to give a temperature of

180° F., can be constructed in the form of a metal cabinet 30 in. by 24 in. by 30 in. high with adjustable shelves, the temperature being obtained from a heating element in the base.

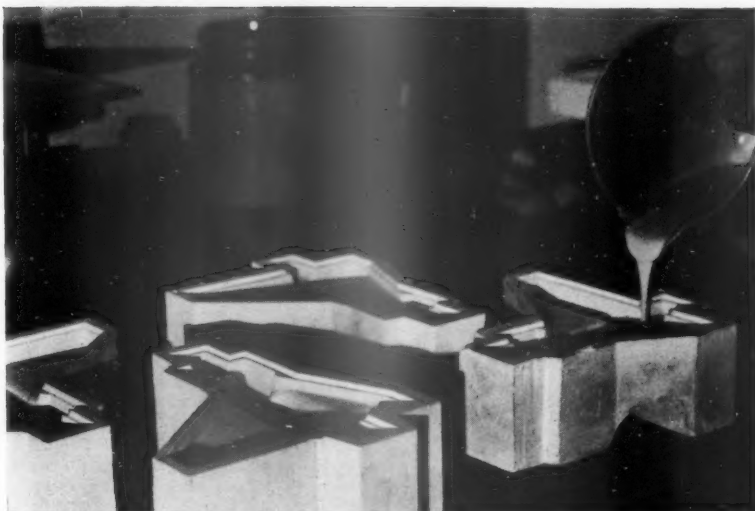
### Preparation of Master Patterns

As the plastic patterns are formed by pouring the resin mixture into open moulds, usually made from plaster, split patterns of the type readily assembled on plates for machine moulding are particularly adaptable. In the first instance a master pattern is required, which may be an existing pattern made for floor moulding, in which case it should be repaired and brought back to perfect condition. This can be done by normal repair methods; re-surfacing with plaster is satisfactory, providing the finished master is well coated with pattern enamel.

The aim should be to have a master pattern dimensionally correct with a perfect surface, as imperfections, even brush marks, are reproduced on the plastic cast. Should it be necessary to manufacture a master pattern this can be of simple construction, as it will be strengthened by fixture to a board during use. The face of the pattern joint is increased  $\frac{1}{4}$  in. to provide material for the subsequent machining. The pattern is then secured to a board, and surrounded by a wooden frame leaving a



*Preparation of mould, showing pouring of plastic into frame*



*Prepared moulds, showing the pouring of plastic material*

minimum of  $\frac{1}{4}$  in. space between the pattern and frame. The size of the frame must be  $\frac{1}{2}$  in. deeper than the highest point of the pattern.

This process is repeated for as many moulds as required. To complete the moulds, the surface which comes into contact with the plastic must be sealed with a release agent. This can be in the form of a conventional wax polish diluted with carbon tetrachloride or a lacquer, supplied by the resin manufacturers, which will give a thin rubber-like film over the plaster surface. This lacquer is for brush application, but it has been found preferable to thin by the addition of 20 per cent thinners and fill the mould, allow to stand for a few minutes and then drain away. This will give a perfect surface free from brush marks, and providing the lacquer is kept clean by frequent straining, can be re-used without wastage. A final drying, and the moulds are ready to receive the plastic. A proprietary brand of plaster sold as Cafferata has been used for the preparation of moulds.

#### **Specification of Mix**

Several formulas are available using Epoxy resin, providing a range of casts from almost glass hardness, to a flexible cast not unlike hard rubber. For foundry patterns the following has proved satisfactory—Epoxy resin, type Epophen 841, 100 parts; calcium carbonate, 75 parts; hardener 715, 15 parts; all measurements being by weight. Before handling these materials a suitable barrier cream should be used, and rubber gloves worn. It is also advisable that all work at this stage should be done in a room temperature of 70° F.

To estimate the quantities required for a particular cast, the master pattern should be weighed, and, if made of pine, it will be found that one and a half times its weight will be suffi-

cient resin therefore, if the pattern weight is 4 oz. and four patterns are required, 11 lb. 8 oz. of resin should be poured into a Pyrex mixing vessel. To this is added 1 lb. 2 oz. of calcium carbonate, this substance, or similar fillers, counteract contraction, and using the above proportions, contraction will be negligible. Fillers also tend to increase mechanical strength, and very much reduce cost.

The hardener, 3 oz. 9 drams, should now be added and mixing continued, it being particularly important that the mixing should be thorough. The inclusion of some air in the mix is unavoidable, but most of this will rise to the surface and be removed when the joint or top face is machined. The mix should now be poured into the moulds slowly and with care, to avoid trapping air pockets. The casts can remain

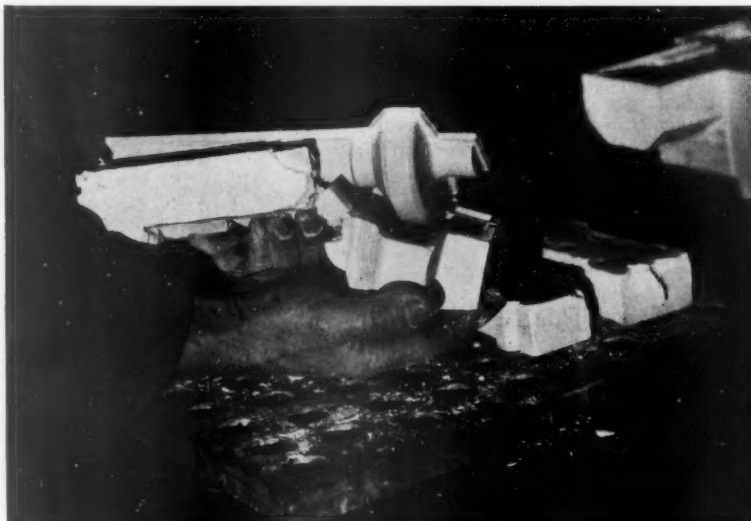
undisturbed in a temperature of 70° F. for about 6-8 hr., then transferred to the oven, and the temperature increased to 180° F. for 4 hr. On returning to normal temperature the moulds can be stripped from the pattern. This should be done with care as, until the material reaches full mechanical strength in about 48 hr., there is a tendency to brittleness.

Apart from machining the top face, a pattern miller using tipped tools being ideal for this purpose, the only finishing required will be to remove any surface imperfections reproduced from the master, and to give the whole surface a light polishing with fine abrasive paper. For patterns larger than the example used in the foregoing, shell-type patterns can be made by introducing a plaster core. The moulds are made in the usual way and lined with  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. thickness of plasticine. To preserve the plasticine for future use it is covered with a film of cellophane and a mix of plaster poured to form a core. When firm, this core is removed, the plasticine taken from the mould, and the core and the mould dried and treated with the release agent. Wooden strips to carry the core level with the mould face are secured with an adhesive, the core placed in position and the cast made as before; the saving in material costs will justify the time spent in making the core.

#### **Reinforcement of Patterns**

The application of plastics for foundry patterns can be developed further by the introduction of reinforcements. This can be in the form of Fibreglass matting for large areas, or Fibreglass rovings are more adaptable to confined sections. Pieces of matting, and/or rovings, are cut to suitable sizes, and thoroughly impregnated with the resin mix. As the mould is being

*(Continued on page 598)*



*Mould at normal temperature being stripped from pattern*



## Power Signalling at Cowlairst, Glasgow

*Electro-pneumatic point operation, colour-light signals and route relay interlocking have replaced eight signalboxes*



*Cowlairst new signalbox. In right background is the power house containing compressor sets and standby generator*

THE railway routes in and near Glasgow, now forming part of the Scottish Region but originally owned, in some places jointly, by the North British, Caledonian, and Glasgow & South Western Railways — later L.N.E.R. and L.M.S.R.—are very involved and include many junctions, connecting loops and spur lines, in turn necessitating under mechanical signalling a great many signalboxes, often comparatively close together.

Electro-pneumatic power signalling was applied in the early years of the present century at the Caledonian Company's central terminus and electro-mechanical equipment, replaced between the wars by all-electric, was installed at St. Enoch, G.S.W.R. Nothing more was done, however, in this direction until the conversion of the old Caledonian underground line to colour-light signalling, illustrated in our issue for December 28, 1956, and the re-signalling of the Cowlairst area, on the former N.B.R. line out of Queen Street terminus, were undertaken. This last-mentioned work we are now able to describe.

### General Features

The installation covers a route mileage of  $6\frac{1}{2}$  and involves the Western end of the Queen Street-Edinburgh main line, except the terminus itself, and certain branches. The approach to Queen Street, with its severe gradient, tunnel and overbridges makes that terminus one of the most difficult on British Railways to operate. All important steam trains have to be assisted by banking engines in the up direction, where for many years cable haulage was used for that purpose, with consequent additional burden on line capacity. Cowlairst Junction itself is the main one serving the diverging

routes to the east, north, and west of Glasgow, for both passenger and freight working, and also important motive power and the carriage and wagon depots.

The area was therefore considered particularly suitable for the application of modern power and colour-light signalling equipment and it was decided to use electro-pneumatic operation for the points.

The arrangement of the layout, and also the position of the various signals, points, etc., is shown on the accompanying diagram. The new signalbox, located in the fork of the junction between the main Edinburgh and West

Highland lines, has replaced eight mechanical ones, known as Cowlairst Station, Cowlairst Central, Cowlairst West, North, and East, Springburn, Bishopbriggs and Cadder West, effecting a very great economy in operating staff. These boxes contained 245 working mechanical levers.

### Signals

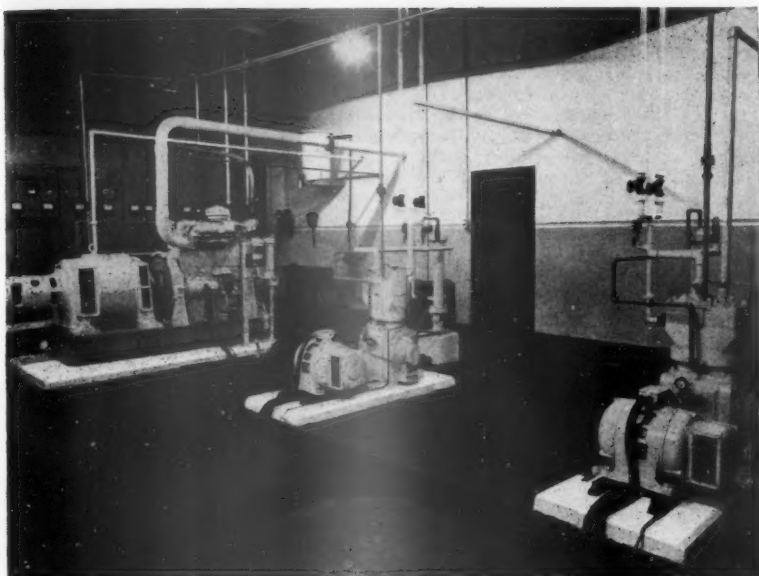
All running signals are colour-lights, using 12V., 25W., S.L.17 type lamps, either 2-, 3-, or 4 aspect, combined at points of divergence with position-light junction indicators, or route indicators, as the circumstances require. Shunt and subsidiary signals are of the two-aspect Westlyte position-light pattern, in which a novel optical unit is used giving concentric parabolic reflection from transparent plastic. The effect is obtained by total internal reflection from the entire surface of the parabolic shaped cups, which are nested together to provide a spherical recess at the smaller end, into which the lamp is inserted.

### Points

There are 52 individual sets of points, the mechanisms of which are operated by air at a pressure of 50 lb. per sq. in., controlled through "cut-off" type valves, which immediately arrest the flow of air the instant the stroke of the points has been fully completed and thus ensure the maximum economy of air consumption. As an additional safety precaution, all facing points have an electrically



*Interior of new signalbox showing staff at control panel*



*Power house showing standby diesel motor generator and compressor sets*

operated ground track lock which holds the mechanism against movement when a train is occupying the track circuits covering them.

Track circuits are of conventional type working on a.c. with reactance feeds; there are 120 in all.

#### Signalbox

The new box, containing an operating room, relay room, and accommodation for staff, is built of steel framing and brick, with pre-cast concrete floors. The operating room, reached by an internal staircase, has large plate glass windows designed to give a comprehensive view of the line on each side, with the route switch console or desk and illuminated diagram at the south end and signalmen's messing facilities at the north. The floor is covered in polished beech, but all other woodwork is in teak.

The control desk has 214 individual route switches and is located at such a distance from the diagram as to afford the signalmen a comprehensive view of the latter. The switches and all relays used in the box are of plug-in type and can be changed without disconnecting any wiring.

The diagram has white route lights which become illuminated when a signalman has actuated a particular switch, giving an indication that all points in the intended route have operated and been correctly detected in the required position. The occupied condition of a track circuit section is indicated by red lights. The equipment has been arranged to enable the control desk to be operated by two signalmen, or three at busy periods.

Storage type train describers are provided on all lines leading to and from Cowairs and their indications follow automatically the movements of

the trains as they proceed from signal to signal. There are also telephones at all running signals. The central battery type is used for those near the box and selective equipment for more remote locations. Loudspeaker apparatus gives communication with the shunters at various points, and the drivers of engines which are leaving the shed. The keys for the telephones, loudspeakers and describers are built into the control desk for ease of operation.

On the ground floor of the building is the relay room, measuring 73 ft. by 28 ft. 6 in., with red quarry tile floor

and plastered walls and ceiling. Natural lighting is afforded by hollow glass blocks built in panels with pre-cast concrete surrounds. This room has a CO<sub>2</sub> fire protection system which is arranged for both manual and automatic operation.

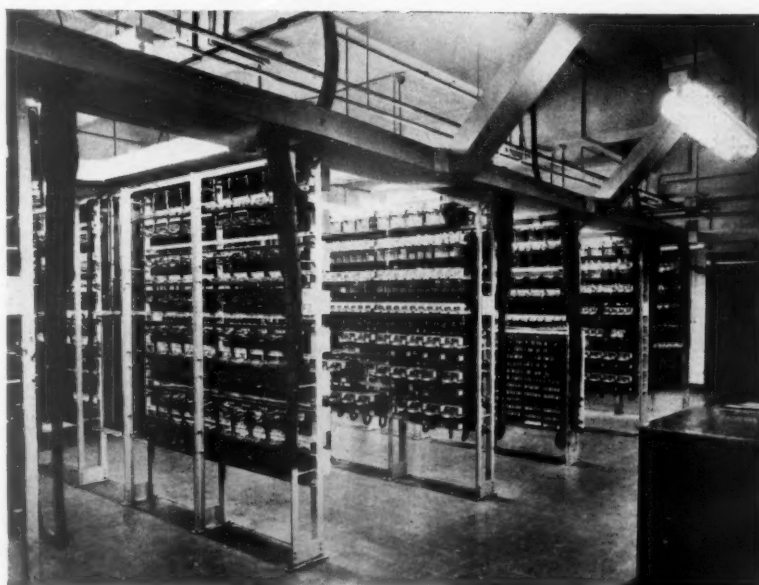
The remainder of the floor is occupied with the linemen's workshop, mess-room, lavatories, and a chamber for a fully automatic oil-fired boiler to give central heating.

#### Power House

The power house is of brick with concrete roof. The compressor room, measuring 40 ft. by 29 ft., with quarry tile floor and plastered walls, contains two compressor sets and the standby generator. It has full height doors at the front, flanked by high level windows, to facilitate handling of the equipment. At the rear is a small workshop and an enclosed area containing high and low pressure air receivers and cooling tanks.

#### Electrical and Air Supplies

Incoming electric power is taken from two separate 415-V. three-phase, four-wire, 50-cycle supplies, treated as main and standby respectively, with automatic changeover in the event of failure. This supply is used for the electrically driven compressors, signalbox lighting, subsidiary heating, etc., and a 240 V. supply, between phase and neutral, is used for signalling purposes. A diesel engine with standby alternator, which also provides the mechanical drive for a standby air compressor, ensures a 240 V. single-phase signalling feed being available, should both the incoming supplies fail. This set is started by hand using one of three methods, viz: (1) electrically, by current taken from a 24 V. "Nife" type battery; (2)



*Relay room showing relay racks and plug-in relays*

hydraulically, through an oil cylinder pumped up to pressure manually before each start; and (3) by an ordinary starting handle.

The engine is a heavy oil Ruston 4YE of the vertical four-cylinder four-stroke type, running at 1,000 r.p.m., developing 50 b.h.p. for 12-hr. periods or 55 for an occasional 1-hr. interval; mounted on the same bedplate and flexibly coupled to it is a revolving armature type Lancashire-Crypto alternator.

Emergency lighting for the signal box control and relay rooms is taken from this set but in addition pilot lighting automatically illuminates the starting equipment panel when all supplies are cut. The standby compressor is driven by V-belts from a pulley on the engine crankshaft, adjacent to the coupling.

The main electrically driven compressors at the Cowlairs power house are of the Broom & Wade EH 220 twin cylinder, water-cooled type, de-

livering 50 cu. ft. of free air per minute at 450 r.p.m. with British Thomson-Houston 15-h.p. motors. As some of the points operated from Cowlairs box are situated at Bishopbriggs and Cadder a further set of equipment is located at the latter place comprising duplicate electrically driven compressors, and a standby diesel driven one. The former, as at Cowlairs, are fully automatic and operate by change of pressure in the receivers.

Should the electric power supply fail the standby compressor comes automatically into action and continues to pump, unloading automatically when correct pressure is obtained, until the set is manually stopped and the electric compressor circuits are re-set.

Air is compressed initially to 100 lb. per sq. in. and reduced to 50 lb. working pressure in the mains, ensuring that moisture-free air is delivered to them.

There are 143 miles of single-core

wiring and 55 miles of multi-core cables. Power distribution is effected at 440 V. a.c. by suitably divided ring mains with spurs to outlying points. Lead alloy sheathed, oil impregnated paper insulated cable is used for the multi-core signalling and power supply runs, with rubber insulated taped and asphalt compounded cable for wiring to wayside equipment, such as signals and points, and P.C.P. plastic sheathed and insulated armoured cable for telecommunication circuits.

The work was carried out under the direction of Mr. L. J. M. Knotts, Signal Engineer, Scottish Region. The contractors for the signalling equipment were the Westinghouse Brake & Signal Co. Ltd. Telephones, loudspeaker equipment and train describers were provided by Standard Telephones & Cables Limited. The contractors for the building work were Robert Gilchrist & Son Ltd., of Glasgow.

### Pattern Making in Plastics

(Concluded from page 595)

filled the reinforcement is placed in position, building up in layers as in lamination form. It will be advantageous if the resin mix is allowed to stand from 20-30 min. to allow it to thicken before pouring. This thicker mix will tend to hold the reinforcement in position. The result will be a case of remarkable strength. This technique can be applied particularly to the manufacture of core boxes. Small and medium size core boxes require a wall thickness of  $\frac{3}{4}$  in. to 1 in., and with reinforcement, will stand a reasonable amount of rapping. The exceptionally smooth surface of the core box will reduce the need to rap to a minimum.

Repair of patterns and core boxes is a simple operation. In the case of breakage, the break surface should be thoroughly cleaned, and a normal resin mix used as an adhesive. Should a part be broken and lost, the shape can be rebuilt by using a resin mix which has been allowed to stand until thick enough to be applied with a palette knife. In all cases of repair heat-treatment should follow, and the rough built-up area be filed into shape. The actual attachment of the patterns to the plates is a relatively simple operation, the plastic material being readily drilled and tapped to facilitate securing by normal methods.

Plastic patterns can be produced at a cost of little more than wood patterns, but it should be appreciated that the superior surface of the plastic pattern is permanent, there is no movement of material which can so often cause trouble during production when using wood patterns for machine moulding. Furthermore, the association of damp and warm sand does not affect the plastic surface, and many thousands of moulds can be produced

without pattern attention. Plastic patterns in comparison with metal patterns show considerable saving both in manufacturing costs and time. The production of a plastic pattern from a master is so good, that, providing the master is correct, the finishing of a plastic pattern is confined to surface polishing, and when this is compared with the heavy cost of shaping and filing metal patterns, plastics become an attractive investment. Proprietary brands of material referred to were supplied by the following manufacturers:—

Plaster Cafferata .. ..	Cafferata Limited.
Epophen resin and lacquer ..	Leicester Lovell & Co. Ltd.
Fillers—Calofil E <sub>2</sub> .. ..	John & E. Sturge Limited.
Reinforcement .. ..	Fibreglass Limited.

**SHIP FOR ARRAN SERVICE LAUNCHED.**—The m.v. *Glen Sannox*, designed to carry passengers, merchandise, and motor vehicles, was launched recently from the yard of the Ailsa Shipbuilding Co. Ltd., Troon, by Mrs. James Ness, wife of the General Manager of British Railways, Scottish Region. Mr. Ness is also Chairman & Managing Director of the Caledonian Steam Packet Co. Ltd. The new ship is similar in design to, but considerably larger than, the general-purpose vessels at present maintaining the Gourock—Dunoon and Wemyss Bay—Rothesay services. She will have accommodation for 1,000 passengers, 40 motorcars, and 40 tons of cargo in containers. She will be fitted with radar and will incorporate the most modern equipment. The *Glen Sannox* is expected to take up service between the mainland and Arran towards the end of June. Included in the guests representing the British Transport Commission were Sir Ian Bolton, Chairman, and Mr. Peter Meldrum, Member, Scottish Area Board, British Transport Commission; Mr. G. W. Stewart, Assistant General Manager, Scottish Region, British Railways; Mr. A.

Stewart, General Manager, Caledonian Steam Packet Co. Ltd.; and Messrs. W. P. Allen, Manpower Adviser, E. R. Dewdney, Shipbuilding & Marine Engineering Officer, and M. H. B. Gilmour, Chief Solicitor, British Transport Commission.

**RAILWAY TEST TRACK SUGGESTION.**—At a conference at the Instruments, Electronics, and Automation Exhibition in London on May 8, Lord Halsbury, Managing Director of the National Research Development Corporation, suggested that British Railways should use an enclosed experimental track for testing electronic devices. Referring to a new electronic device making possible direct communication with the driver of a train and the end of complete reliance on visual signals, he said the railways had been presented with a working model and he hoped they would in due course be experimenting with it.

**DUNDEE WEST GOODS DEPOT MODERNISED.**—The Lord Provost of Dundee, Mr. William Hughes, officially opened the modernised Dundee West Goods Depot on May 6, in the presence of Mr. W. G. N. Walker, Member of the Scottish Area Board of the British Transport Commission; Mr. Robert Lyle, Town Clerk; Mr. J. C. Pattison, Chief Constable; Mr. S. E. Raymond, Chief Commercial Manager, Scottish Region, British Railways; other railway officers; and representatives of the trade unions. The ceremony marked the culmination of a scheme designed to concentrate and improve the handling of all freight traffic at one depot in the city in place of two. All British Railways motor vehicles engaged in the cartage of freight traffic will be concentrated at Dundee West Goods Depot, and an average of over 260 wagons containing all classes of freight traffic exclusive of coal will be dealt with each day. At a luncheon after the opening, Mr. Walker stated that it augured well for the success of the concentration scheme that representatives of both the management and the staff should come together on such an occasion. Mr. D. Donaldson, replying on behalf of the staff, expressed his confidence that the close collaboration at all stages between staff and management would ensure the success of the scheme.



## Reconstruction of Johannesburg Station

*Whole area lowered by 13 ft. : seven bridges built across the station and its approaches*



*The station from the east showing the many bridges*

west side facing the forecourt. Similar facilities are being provided for non-European passengers. This part of the station, complete with concourse, escalators, and forecourt, is beginning to take shape. Facilities in the concourse area will include an enquiry office, restaurant, cafeteria, post office, shops, and modern ticket offices. Parking facilities will be available, with access from Noord and Hoek Streets.

### Concrete Beams

An interesting feature of the roof of this concourse is the use of pre-cast pre-stressed concrete beams spaced at 6-ft. centres with pre-stressed concrete planks spanning between beams. The beams have already been constructed and are 75 ft. long, vary in height from 2 ft. at the ends to 3 ft. in the middle, have a maximum width of 10 in. and weigh about nine tons each. The pre-stressed beams will be supported at their ends on cast-in-situ reinforced concrete beams and columns and will be situated at a height of 36 ft. above the concourse floor level. Lifting towers have been constructed to lift the beams to the required height. Cantilever trolleys running on rails mounted on the beams will carry the pre-stressed beams from the lifting towers to the final positions allocated to them. Work has also started on the construction of ramps to admit motorcars to the main-line platforms. The ramps are expected to be in use in about a year's time.

A slab, 75-ft. wide, will be built over main-line tracks on the east side

**WORK** on the new station at Johannesburg which was started in April, 1946, has now been in progress for 11 years. The complete rebuilding of the station which necessitated the lowering of the whole area of 14 acres by a maximum of 13 ft. was divided into four stages. Stages one and two have been completed and stage three is in progress. During this time many makeshift schemes have been necessary to ensure normal services during alterations. This was accomplished to such good purpose that scheduled services were never seriously disrupted. The total estimated cost of the station amounts to £8,391,700 and the expenditure to date is approximately £6,800,000.

### Public Facilities

Stage three constitutes improvements to the station from the public point of view, and includes the completion of an eight-acre concrete deck slab covering suburban and parcels platforms. On the deck slab immediately east of the Johann Rissik Bridge will be located a forecourt area attractively laid out with gardens, lawns, taxi ranks, and parking bays for the private motorist, together with a European suburban concourse with amenities that will give Johannesburg one of the most modern stations in the world.

Erection of steelwork for the concourse is about to start. This building, when complete, will provide a vast hall 290 ft. long, 140 ft. wide and 50 ft. high, and will contain enquiry and ticket offices, restaurants, and shops.

Stairways and reversible escalators will lead from the floor of the concourse to the platforms 19 ft. below.

The southern entrance to the station will be through a foyer which is on the ground floor of the eight-storey Tippet Building, constructed two years ago between the old station building and railway headquarters at the foot of Joubert Street. The main entrance to the station will be on the



*A north-eastern view showing the Tippet Building in the centre background*



*Concrete slab over the main-line platforms under construction*

of the station to join the spiral road leading to the lower parcels road with the suburban deck slab immediately to the south. Access to the platforms will be along this new slab and down three ramps leading to the three main line island platforms. Exit will be by means of three further ramps leading from the west end of each of the platforms to a bridge which will be constructed parallel to Harrison Street on the west side and which will terminate in a second bridge which will run at right angles to it and which will join Harrison Street on the north side of the tracks. Positions of bridges have been carefully chosen to fit in with future development.

Stage four will see the extension of the slab over the main line section of the station on which work has already started. Completion of the slab and the construction of the main-line concourses above slab level will, however,

have to await the withdrawal of all steam traction through Johannesburg station.

#### Drainage

There are some two miles of tunnels below the surface to provide for the conveyance of mail, parcels and baggage, signal cables and drainage. In addition there are 10 miles of pipes for drainage, sewerage, and electrical cables. Drainage is extremely important in a layout which is below the surrounding area and this was one of the first aspects to be tackled when excavations were started on the north side of the old station, for miniature lakes were formed on the site whenever rain fell.

An outlet was tunnelled 40 ft. under ground level on the north side, and consequently when excavations reached their final level disposal of stormwater presented no further problems.

Two important buildings have been completed in the station area. These are the Tippet Building on the South side of the station and the Communications block on the north side. The Tippet Building, which stands like an archway over the south passenger entrance to the station, was built at a cost of £220,000 and houses the civil engineering staff of the railways. The ground floor of this building is an open area, with outlets to the east and west giving access to the platforms. The north side will eventually be opened when the suburban station nears completion. The ground floor, the ceiling of which is fairly high, gives a general idea of spaciousness. It houses temporary suburban ticket and enquiry offices for Europeans, a chemist's shop, a gents' hairdressing saloon, a fruit and sweet shop, two bookstalls and the lifts placed at the western end of the building. Work will also start soon on a new administrative block which is estimated to cost £1,934,600. The building is now in the design stage and an amount of £20,000 will be spent on it during this year.

#### Bridges

Bridges across and around the station were built at a cost of nearly £1,000,000. Seven in all had to be either built, widened or lowered and an outstanding feature of these bridges is that they are all practically at road level. This was made possible by the lowering of the station by 13 ft. The most imposing among them is the Johann Rissik Bridge which stretches across the west side of the station, a distance of 1,000 ft. It is also the longest of the seven and its total cost has amounted to about £275,000.

The station has a railway museum, located under the Johann Rissik Bridge and contains about 1,700 exhibits, some dating back to 1706. The story of the South African Railways and its associated services, airways, road services and harbours, is graphically told by the collection of transport Africana on view.

**GERMAN LOCOMOTIVE INDUSTRY SETBACK.**—The German locomotive industry has experienced a decline in exports of some 40 per cent in the last two years. In 1954, the value of exports was DM. 166.5 million; in 1955, DM. 115.7 million; and in 1956, DM. 92.5 million. More than two-thirds of the locomotives exported were sent to non-European countries, India being the largest customer, followed by Iraq, Cuba, and East Africa. The decline is attributed to "dumping" prices quoted by Japan and Russian-dominated countries.

**CLAY CROSS TUNNEL REPAIRS.**—Repairs to the brickwork lining of Clay Cross Tunnel on the main Derby-Leeds line of the former Midland Railway, now London Midland Region, will begin at the end of May and is expected to take 18 months. The tunnel is 117 years old and just over a mile long, and is brick-lined throughout, with nine ventilating shafts, and takes

two lines of track. The work is a major scheme and involves renewal of the inner two rings of brickwork for about a quarter of the tunnel's length. The lining for the remaining three quarters will be repointed. An arch with a framework of old steel rails will be made to fit the profile of the tunnel and this will carry timber lagging to support the brickwork during the cutting out of defective work and subsequent rebuilding. The tunnel train and materials will be accommodated at a special siding and there will be temporary living and feeding accommodation for the tunnel gangs.

**SECOND PROTOTYPE LONDON TRANSPORT BUS IN SERVICE.**—The first London Transport double-deck bus with fully-automatic transmission went into service on May 20 on route 406, Redhill to Kingston. The new vehicle—the second of the prototype "Routemasters," classified RM.2, is in most respects similar to the original RM.1.

It is a 27-ft. 6-in. × 8-ft. vehicle of integral construction, with coil spring suspension all round (independent fronts) and is powered by an A.E.C. AV.590 9.6-litre engine; A.E.C. also supplied the other mechanical units. The body, in the development of which Park Royal Vehicles Limited was associated, is to a London Transport detailed design, and has 64 seats, 28 on the lower and 36 on the upper deck. A heating system provides fresh warm air on both decks. Unlike the earlier "Routemaster," the bus is fitted with fully-automatic transmission, the epicyclic gearbox being electro-hydraulically operated and controlled through the recently developed C.A.V. control circuit. Power-assisted steering is also incorporated on this model. The RM.2 will be tested for a short period in the Country Area and has therefore been finished externally in the London Transport conventional green livery. It will subsequently be transferred for extended tests in the Central Area.

## RAILWAY NEWS SECTION

## PERSONAL

Mr. C. W. Reeves, Accounts Officer, Finance Department, British Road Services Headquarters, has been appointed Chief Financial Officer, B.R.S., succeeding Mr. N. R. Bellwood.

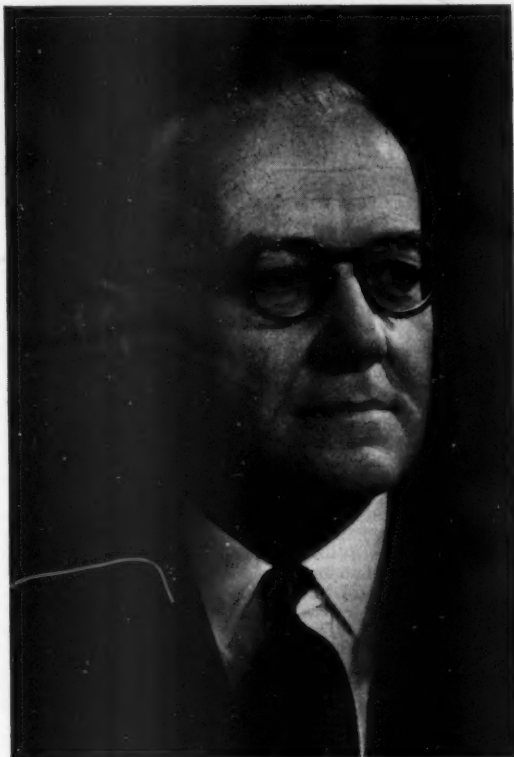
Sir George H. Nelson, Bt., Chairman of the English Electric Group, who, as recorded in our May 10 issue, has been elected

a member of the Percy Committee on Higher Technological Education, and, in 1945, Chairman of the Government Census of Production Committee. In that year also he assisted in the deliberations of the Government Committee on Future Scientific Policy. A knighthood was conferred on him in 1943 and a baronetcy in 1955. A member of the Governing Body of the Federation of British Industries for the past fourteen years, he was President of that body

Department of the Buenos Ayres Great Southern Railway, serving in various capacities until appointed Assistant Chief of Control & Movement for the Southern Division in April, 1927. In 1928 he entered the service of the Sudan Railways as District Traffic Manager, serving in that capacity and as Assistant Operations Superintendent until 1935. Between 1941 and 1944 Mr. Willoughby, who was then Port Manager, represented the Ministry of War Transport



*Sir George H. Nelson, Bt.,*  
Elected President, Institution of  
Mechanical Engineers, 1957-58



*Mr. J. L. Willoughby*  
Appointed Traffic Manager,  
B.R.S. (Parcels) Limited

President of the Institution of Mechanical Engineers for 1957-58, received his early training at the City & Guilds Technical College, London. He was awarded the Mitchell Exhibition and a post-graduate Brush studentship, and became a premium pupil of the Brush Electrical Engineering Co. Ltd. At the age of 22 he was appointed that company's Chief Outside Engineer. He later joined the British Westinghouse Company (now Metropolitan-Vickers Electrical Co. Ltd.) and, by 1920, had established and become Manager of that organisation's Sheffield Works. His association with the English Electric Co. Ltd. began in 1930, when he became its Managing Director. Three years later he was appointed Chairman. During the war, and in addition to his work as Chairman, Sir George Nelson was a member of the Heavy Bomber Group Committee of the Air Ministry, and, in 1942, he was Chairman of the United Kingdom Tank Mission to America and Canada. In 1943 he became a member of the Reconstruction Joint Advisory Council; in 1944,

from 1943 to 1945. He is a Governor of Queen Mary College (University of London), a Member of the Governing Body, an Honorary Member and an Honorary Fellow of the Imperial College of Science & Technology, and a Fellow of the City & Guilds Technical College, London. He is also a Past President of the Institution of Electrical Engineers. On the 13th of this month, Sir George Nelson received the honorary degree of Doctor of Laws at the Convocation at the University of Manchester.

Mr. J. L. Willoughby, Secretary, British Road Services, who, as recorded in our May 10 issue, has been appointed Traffic Manager, British Road Services (Parcels) Limited, was educated at Ovingdean Hall, Brighton, and Westminster School, where he was a classical King's Scholar. He entered the service of the L.N.W.R. as a Probationer in April, 1918, and subsequently obtained experience in all sections of the Traffic and Goods Departments. In 1923 he took up an appointment in the Traffic

in the Sudan. In recognition of his war services he was mentioned in dispatches in 1941 and was made an O.B.E. in the King's Birthday Honours, 1944. He was appointed Traffic Manager, Sudan Railways, in 1944, and Deputy General Manager in 1946. On his return to this country in 1948 he became Assistant Secretary, British Road Services, was appointed Deputy Secretary in 1949 and Secretary in 1953. Mr. Willoughby is a Member of the Institute of Transport and a member of Gray's Inn.

Mr. R. P. Biddle, formerly Docks & Marine Manager, Southampton, British Transport Commission, has been appointed a Deputy Lieutenant for the County of Southampton.

Mr. J. J. Liptrott, Deputy Chief Road Engineer for Scotland, has been appointed Divisional Road Engineer, Wales & Monmouth Division, Ministry of Transport & Civil Aviation, in succession to Mr. L. Cleaver, who retires on July 31 this year.





**Mr. W. H. Vine**  
Appointed Commercial Officer,  
N.E. Region



**Mr. H. Hoyle**  
Appointed Movement Officer (Headquarters),  
Eastern Region



**Mr. G. Crabtree**  
Appointed Assistant to the Operating Superintendent  
(Modernisation), Scottish Region

Mr. William Harold Vine, M.Inst.T., previously District Goods Manager, West Riding District, North Eastern Region, British Railways, who, as recorded in our May 10 issue, has been appointed to the newly-created position of Commercial Officer, North Eastern Region, was educated at Watford Grammar School and began his railway career in the General Manager's Buying Department of the London & North Western Railway at Euston in 1916. He subsequently transferred to the Commercial Department, and served for a period at stations and in the London Midland & Scottish Railway Headquarters Rates and Development Sections. He then joined the staff of the Continental Traffic Manager and took part in the institution of container services between this country and the Continent. In 1933 Mr. Vine returned to the Commercial Department Headquarters at Euston as Assistant Head of Claims and subsequently became chief of the London District Claims Office. After the outbreak of war he was attached to the Vice-President's office for special duties and, in 1941, was appointed Salvage Officer responsible for measures in connection with the recovery and disposal of scrap and other materials on the L.M.S.R. In 1944 he returned to the London District as Assistant District Goods Manager, Broad Street, and, in July, 1948, became Chief of the London Commercial Service (Goods & Parcels and comprising the London Wool Office) where he initiated and built up a system of centralised commercial representation with Metropolitan and Greater London, covering all Regions of British Railways. He was appointed District Goods Manager, West Riding area, North Eastern Region, with headquarters at Leeds, in October, 1954. Mr. Vine is a member of the Council of Leeds Chamber of Commerce, a member of the Yorkshire Coal Exchange and a subscriber to the Wool Exchange, Bradford. He took up his new appointment at York on May 6 this year.

Mr. T. L. C. Strange, at present General Manager of the Rhondda Transport Co. Ltd., has been appointed to succeed Mr. A. J. White as General Manager of the Devon General Omnibus & Touring Co. Ltd. as from a date to be agreed.

Mr. H. Hoyle, M.B.E., who, as recorded in our March 8 issue, has been appointed Movement Officer (Headquarters), Eastern Region, Liverpool Street, British Railways, was educated at Archbishop Holgate's School, York, and began his railway career with the North Eastern Railway in the General Superintendent's Office at York. He became a Traffic Apprentice in 1927 and, after completing his training, was appointed to a position in the Locomotive Running Superintendent's Trains Section at York. He returned to the Operating Department in 1932 and occupied a number of positions dealing with all aspects of passenger and freight train working. In 1944, Mr. Hoyle was promoted from the position of Deputy Chief Controller, North Eastern Area, L.N.E.R., to be Head of the Superintendent's and Locomotive Running Superintendent's Joint Passenger Trains Section, Southern Area, L.N.E.R., and, in 1947, became Chief Freight Trains Clerk & Controller in the same office. In 1948 he was appointed Traffic Officer (Passenger) in the Eastern Group Operating Office attached to the Railway Executive. When, under a change in organisation, the position of Operating Superintendent, Eastern & North Eastern Regions, was created, Mr. Hoyle became Assistant (Passenger Trains) and, in 1952, was appointed Assistant (Freight Trains) to the Operating Superintendent, Eastern & North Eastern Regions. With the abolition of the bi-regional Operating organisation at the end of 1955, he was appointed Trains Assistant to the Chief Operating Superintendent, Eastern Region (now Operating Superintendent, Eastern Region).

Mr. H. W. Charles, Assistant District Motive Power Superintendent, Colwick, Eastern Region, British Railways, has been appointed District Motive Power Superintendent, Grimesthorpe.

Rear-Admiral F. S. Billings, Chief Engineer to the Consett Iron Co. Ltd., has been appointed a local director of that company.

Mr. W. Manning Dravers has been appointed to the board of the Northern General Transport Co. Ltd. in place of Mr. P. G. Stone Clark.

Mr. G. Crabtree, District Operating Superintendent, Edinburgh, Scottish Region, British Railways, M.B.E., M.Inst.T., who, as recorded in our May 3 issue, has been appointed Assistant to the Chief Operating Superintendent (Modernisation) of that Region, began his career with the London & North Eastern Railway as a clerk in the District Superintendent's Office, York, in 1925. He became a Traffic Apprentice in 1932 and trained in this capacity in the Southern Area of the L.N.E.R. until 1935 when he was attached to the Superintendent's Office at London, Liverpool Street. In 1937 he was appointed Assistant Yardmaster at Colwick and in the following year returned to York to the Superintendent's Office. In 1941 he became Chief Trains Clerk & Chief Controller in the offices of the District Superintendent and District Locomotive Superintendent at Newcastle. In 1944 he took up the position of Chief Freight Trains Clerk & Chief Controller in the Superintendent's and Locomotive Running Superintendent's offices at Edinburgh. He was appointed Trains Assistant to the Superintendent and Locomotive Running Superintendent, Scottish Area, in 1945, and became District Operating Superintendent, Edinburgh, in 1947. Mr. Crabtree was appointed a Member of the Order of the British Empire in June, 1950.

In pursuance of its policy to co-ordinate traffic functions, the North Eastern Region of British Railways announces the formation of four regional areas, each under the supervision of a Traffic Manager (see also March 29, 1957, issue, p. 378). Appointments are as follow:—

Mr. J. H. M. True, now District Goods Manager, Newcastle, as Traffic Manager, Tyne & Wear (headquarters at Newcastle).

Mr. K. A. Kindon, now District Commercial Manager, Middlesbrough, to be Traffic Manager, Tees-side (headquarters at Darlington).

Mr. E. E. Cowell, now District Operating Superintendent, Newcastle, to be Traffic Manager, West Riding, Yorks (headquarters at Leeds).

Mr. I. G. MacGregor, now District Operating Superintendent, Darlington, to be Traffic Manager, Hull & York (headquarters at Hull).

**Mr. J. H. Giffin**

Appointed Superintendent (Running),  
London Transport Executive

**Mr. F. J. Lloyd**

Appointed South-West Divisional Superintendent  
(Central Road Services), L.T.E.

**Mr. F. Whyman**

Who assumes an additional appointment with  
M.-V. Electrical Co. Ltd.

Mr. J. H. Giffin, who has been appointed to the newly-created position of Superintendent (Running), London Transport Executive, joined the service of the London General Omnibus Company in May, 1911. Since that time he has served in all sections of the road operating department, becoming Assistant to the Staff Superintendent in 1934. He saw service in the 1914-18 and recent war, attaining the rank of Lieutenant-Colonel. He was awarded the M.B.E. (Military Division) and was mentioned in despatches. On his return to London Transport he was appointed Divisional Superintendent of South-West London (Central Road Services) and assisted with the Tram Conversion Scheme.

Mr. William P. Moffat, Chief of Research, Canadian National Railways, has been appointed to the newly-created position of Co-Ordinator of Data Processing for that system.

Senor Jesus de la Fuente has been appointed Public Relations Officer of Red Nacional de los Ferrocarriles Espanoles (R.E.N.F.E.).

Mr. R. L. Richards has been appointed the first manager of the newly-formed Standards Association of the Federation of Rhodesia & Nyasaland. Mr. Richards, who is a senior technical officer of the British Standards Institution, is expected to arrive in Salisbury at the end of this month.

Mr. Arnold W. Lee has been appointed Managing Director of the Norton Grinding Wheel Co. Ltd., succeeding Mr. John C. Ewer who is leaving to take up a new appointment with the Norton Company, U.S.A.

Dr. Edmund Nathaniel Oyekanmi Sodeinde has been appointed the first District Medical Officer in the Nigerian Railway Corporation Medical Service. Dr. John Dryden is the Principal Medical & Health Officer. Dr. Sodeinde, who is 57, was formerly Senior Medical Officer, Lagos. He qualified in 1939 and holds the degrees of M.A., M.D., B.Ch., B.A.O., and L.M. He was decorated with the Coronation Medal in 1953 and was awarded the M.B.E. in 1956.

Mr. F. J. Lloyd, B.Sc., F.I.A., who succeeds Mr. Giffin as Divisional Superintendent, South West Division (Central Road Services), London Transport Executive, is 44. He was educated at Ackworth School, York, and Liverpool University, where he obtained the degree of B.Sc. in mathematics. In 1947 he became a Fellow of the Institute of Actuaries. Mr. Lloyd joined London Transport in 1947 and was made Principal Executive Assistant to the Staff Administration Officer in 1949, becoming an Officer of the Executive three years later. In 1955 he transferred to the Department of the Operating Manager (Central Road Services) and in 1956, was appointed Assistant Divisional Superintendent in the North East Division. During the war he served with the Royal Air Force.

Mr. Gordon Richardson has been appointed a director of Head Wrightson & Co. Ltd.

Mr. F. Warhurst has been appointed Commercial Director of the Brush Electrical Engineering Co. Ltd.

Mr. Felix L. Levy, Joint Managing Director of George Cohen Sons & Co. Ltd., has been elected President of the National Federation of Scrap Iron, Steel and Metal Merchants.

Mr. P. L. Pocock has been appointed General Manager of the engineering division of Sheepbridge Equipment Limited, a subsidiary of Sheepbridge Engineering Limited.

Mr. J. A. Hill, A.M.I.C.E., who joined the P. & M. Co. (England) Ltd., in May, 1956, as Technical Assistant to the Managing Director, has now been appointed Chief Engineer of the company.

Mr. H. Smith, Superintendent at the Kinlochleven Routine Laboratory of the British Aluminium Co. Ltd., will relinquish this position with effect from May 31, 1957, on becoming Laboratory Superintendent at the Baie Comeau Works of the Canadian British Aluminium Company. He will be succeeded at Kinlochleven by Mr. W. McCamley.

Mr. F. Whyman, B.Sc.Tech., M.I.E.E., who, as recorded in our May 3 issue, has been appointed Chief Engineer of the newly-organised Traction Division of the Metropolitan-Vickers Electrical Co. Ltd., in addition to his duties as Chief Engineer, Traction Projects Department (see May 3 issue, Personal Section, for details), gained an honours degree at Manchester University. He joined Metropolitan-Vickers in 1924 as a trainee in the Traction Department, and continued as an engineer in the Traction Control Department until 1944, when he was appointed Chief Engineer, Traction Projects Department. Mr. Whyman has travelled widely in connection with the company's traction contracts overseas.

The Northern Aluminium Co. Ltd. announces the following new appointments: Mr. J. H. Mayes, formerly Assistant General Sales Manager, as General Sales Manager succeeding Mr. S. E. Clotworthy who has become Managing Director following the appointment of Mr. Fraser W. Bruce as President of the Aluminum Company of Canada. Mr. D. A. Corbett-Thompson, Manchester Sales Area Manager, to be Sales Manager (Export); Mr. E. D. Iliff, Manager, Sales Development Division, Banbury, to be Sales Manager (Sales Development, Advertising and Publicity); Mr. F. Layton, Manager, Sales Administration Department, Banbury, to be Sales Manager (Sales Administration), and Mr. D. A. Pinn, Manager, Export Sales Department, to be Sales Manager (Domestic).

The following re-election, election and replacement elections have been made to the British National Committee of the International Congress on Combustion Engines (C.I.M.A.C.):—

Mr. W. K. G. Allen has been re-elected Chairman, the office he has held since the inception of the Committee.

*Appointed Representative of Trade Association*  
Mr. W. Pickett (Locomotive & Allied Manufacturers Association of Great Britain), succeeding Mr. T. Greenwood.

*Elected Representatives of Contributing Parties*  
Mr. K. Arter, Esso Research (representing Oil interests), succeeding Mr. L. E. Lowe.

Mr. J. S. Tritton (representing the Diesel Engineers & Users Association).

## NEW EQUIPMENT AND PROCESSES



### Hand-Operated Elevator Truck

**T**HE Vertolifter elevator truck is designed to deal with loads up to 500 lb. where a power driven machine is not required. Duties would include general light workshop duties such as loading vehicles and stores use.

The truck incorporates a double-acting hydraulic pump for elevating the platform. This pump is operated by a hand lever and will lift the load to a height of 55 in., a roller chain being incorporated in the lifting mechanism. Lowering can be effected slowly or quickly as required.

The frame of the truck is of steel channel section, and the platform has four

roller bearing guide wheels. It is fitted with two roller bearing front wheels and two swivel castors at the rear and will turn in its own length. Overall width is 23½ in. and height 75½ in.

The machine is available with two sizes of platform, either 9½ in. × 19 in., or 15½ in. × 19 in. The former size of platform is suitable for handling small post type bin pallets.

Details of price and delivery can be obtained on request from the manufacturer, Powell & Company, Burry Port, Carmarthenshire.

### Electronic Level Control

**T**HE TLC.1 level control incorporates transistorised and printed circuit techniques, which result in a rugged, mobile unit of low initial and running cost. The unit is suitable for batching or for maintaining a constant level or high and low levels in liquid, granular, or powder substances in hoppers, rail wagons, and other bulk containers.

The unit can be used as an indicating or controlling device. It operates on the principle that the change in capacitance at the probe or other electrode in the container due to the presence of the material under control causes the operation of a relay in the main unit. This relay can be used for control or indication purposes as desired. A number of versions of the main unit will be available to meet varying requirements. A common basic form of probe head, however, is used in all applications.

With the TLC.1 much of the circuit is housed in the probe head attached to the container, and only two connections plus earth are needed between the head and the main unit. These connections can be made any desired length and there are no special requirements as far as the cable is concerned. The maximum potential involved on the connecting cable is 12 V. with consequent safety in hazardous locations. The equipment will be available to

suit various supply voltages, and for special applications a battery-operated form is also supplied.

The details of price and delivery may be obtained from the manufacturer, Lancashire Dynamo Electronic Products Limited, Rugeley, Staffs.

### Battery Servicer and Engine Starter

**T**HE Batterymaster, the trade name of a heavy duty battery servicer and engine starter Model AD 50, now available, is suitable for the starting of the diesel



engines of railcars as used on British Railways, and road vehicles.

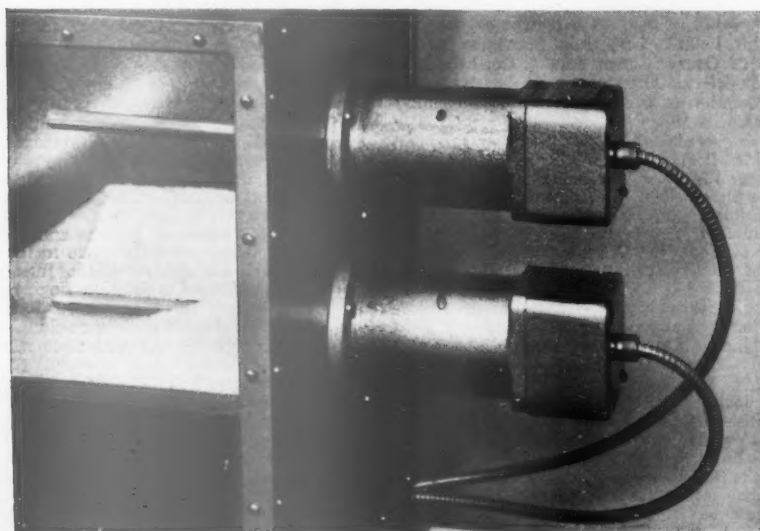
The AD 50 is suitable for 6-, 12-, and 24-V. systems and can be used for battery boosting, safe fast charging, mains engine starting, slow rate charging, and battery testing. Even when the batteries of a vehicle or railcar have been discharged to an abnormally low voltage, the engine may be started by fast charging the battery for a short period.

The engine of the vehicle will then fire, the fast charger having been previously disconnected or, if preferred, used to augment the battery while starting.

The unit comprises a high output selenium rectifier battery charger housed in a strong, compact, cubicle. Approximate dimensions are 30½ in. high; 20 in. wide; 15 in. deep, and it is mounted on rubber tyred wheels to make for easy portability.

The double-wound transformer and selenium metal rectifier are fan-cooled and rated for continuous operation. Charging control is effected by means of a 12-position transformer tapping switch, no power wasting resistances being employed in the circuit.

The standard charger is supplied fitted with heavy-duty output leads and battery clamps but these can easily be replaced by





the user with a 2- or 3-pin plug and socket as fitted to many diesel railcars. The AD 50 is fully protected against misuse by an overload relay which automatically disconnects the mains circuits should the charger be inadvertently overloaded or incorrectly adjusted. Protection for both battery and charger during use is by a thermostat inserted in one of the middle cells; this thermostat will automatically switch off the charger when the battery is correctly charged.

As a fast charger the Batterymaster will charge a 6-V. battery at up to 100 A. and a 12- or 24-V. battery at up to 50 A. For engine starting purposes, it will develop up to 250 A. to supplement battery capacity and deliver the very high current which is required for starting a diesel engine.

The manufacturer is prepared to modify the basic design of batch quantities of the machine to suit the requirements of railway managements, if they vary from the standard model.

The price of the AD 50 is £98 and delivery is seven days for the standard design and 8-10 weeks for specially designed cubicles manufactured to customers' requirements. The manufacturer is Crypton Equipment, Limited, Bridgwater, Somerset.

## Radiant Space Heater

THE Metrovick Radiant Space Heater can be used in large workshops, running sheds, and so on, for heating a small area such as that occupied by a fitter on



locomotive maintenance, without the necessity of raising the ambient temperature of the air in the building. Normally, convectors or forced-air-passage equipment are used in a large workshop, and while they are acceptable in some cases, they can be uneconomical in spacious premises, more particularly if the heat is needed to warm staff in a confined area, or for a limited period each day. As radiant heat does not heat the intervening air, but only the object or person on which it falls, it can also be adopted for use in exposed situations.

The Metrovick unit consists of an aluminium reflector, tubular metal sheathed heating element, stainless steel element supports, reflector support bracket of mild steel phosphated and finished in heat resisting paint, and a die-cast aluminium alloy weatherproof terminal box. The element ends have special weatherproof seals with screwed terminals and are themselves

sealed into the terminal box with silicone rubber bushes. The terminal box cover is provided with a butyl rubber gasket and is secured by a single fixing screw.

The unit weighs 5 lb., which simplifies the supporting arrangement and enables the heater to be mounted from the terminal box by the use of only a single 1-in. dia. conduit.

A fixing bracket enabling angular adjustment in one plane is available as an optional extra. The heater can be supplied to suit various standard single phase supply voltages in the 200-250 V. range.

The price of the radiant space heater is £8 10s. The equipment is available from stock. The manufacturer is the Metropolitan-Vickers Electrical Co. Ltd., Trafford Park, Manchester, 17.

## Plastic Tote Bins

SUITABLE for the movement between shops and departments of materials or components such as rivets, bolts and nuts, or for temporary storage between operations, Kabi Tote Bins are being manufactured in two sizes. The TB 250 measures 13 in. x 7 in. x 3½ in. and the TB 300, 17 in. x 12 in. x 8 in.

The bins are made from green polythene, which reduces weight but gives resistance to the rough treatment likely to be met with in service in a railway workshop.

There is consequently freedom from the danger of rough edges or splinters, and the ensuing damage to the materials placed in the bins, from contact with the sides or bottom. Other advantages claimed are resistance to corrosion and weathering, and prevention of condensation. Repainting of these plastic bins is unnecessary because of the absence of colour fade.

The bins have rounded corners to facilitate cleaning and they nest into each other when empty. The TB 250, illustrated, has a built-in index card holder; the larger bin has not, but can be supplied with one, and also with swing-over handles as extras.

The basic prices of the TB 250 and TB 300 Tote Bins are 7s. 9d. and 13s. 6d. respectively. Delivery of both types is from stock.

The manufacturer of the bins is Precision Components (Barnet) Limited, 13, Byng Road, Barnet, Herts.



## Portable Inspection Lighting Set

A BATTERY lighting set, certified by the Ministry of Labour & National Service as intrinsically safe for use in inflammable atmospheres, is suitable for inspection and maintenance of diesel and petrol-engined locomotives, and road vehicles even when there are no special safety requirements.

The equipment, worn on the body, consists of a miner's type lamp connected by a flexible cable to a separate battery container, a webbing body harness, and a heavy-gauge elastic harness which will fit over any normal headgear. The lamp is pre-focused and is switched on and off by a rotation of the front cover. It can be worn in any position on the webbing body harness or alternatively on the elastic head harness.

The battery container, of tough moulded neoprene, is waterproof, impervious to oil or petroleum, and fire resistant. It is carried at the back on the harness waist belt. The lighting set is powered by three standard 1.5-V. unit cells and the total weight including batteries is just under 3½ lb.

The price complete with batteries is £8 10s. and delivery is from stock. The manufacturer is the General Electric Co. Ltd., Magnet House, Kingsway, W.C.2.



## Institution of Railway Signal Engineers

*Annual General Meeting: Mr. A. W. Woodbridge's presidential address*

The annual general meeting of the Institution of Railway Signal Engineers was held in London on April 10, the chair being taken by Mr. J. C. Kubale, the retiring President.

The Hon. General Secretary, Mr. G. J. Dickin, read the minutes of the previous annual general meeting, which were confirmed, and the report of the auditors.

Reviewing the 44th annual report, Mr. Kubale referred to the continued increase in membership and to the activity of the provincial and overseas sections.

The Hon. Treasurer, Mr. B. Reynolds, commenting on the accounts, pointed out that there had been a satisfactory increase in the Institution's accumulated fund during the year. The report and accounts were formally adopted.

After announcing the Council awards for the two best papers read before the Institution in 1956, Mr. Kubale presented the first prize to Mr. O. S. Nock for his paper "Signalling, from the Driver's Point of View," and explained that the second prize was being forwarded to Mr. James Steffensen and Mr. W. Wessel Hansen for their joint paper on "Modern Signalling Practice on the Danish State Railways," as they were unable to be present.

The composition of the Council for 1957 was announced by Mr. Kubale:—

*President:* Mr. A. W. Woodbridge; *Vice-Presidents:* Mr. J. F. H. Tyler and Mr. D. G. Shipp.

*Members of Council:* Messrs. J. S. S. Davis, C. G. Derbyshire, F. B. Eginton, R. A. Green, F. G. Hathaway, L. J. M. Knotts, W. Owen, E. A. Rogers, J. Sulston, A. F. Wigram, B. H. Gross, O. H. Hoffman, M. Le Sueur, F. Mann, A. L. Mills and A. E. Walker.

Messrs. C. F. Burton & Co. were re-elected Auditors.

Mr. Kubale referred, with regret, to Mr. V. S. King's retirement from the position of Hon. Editor of the Institution's Journal, which he had filled in an exemplary manner over 10 years.

### New President Installed

He then invited the new President, Mr. A. W. Woodbridge, to assume the chair, and invested him with the chain of office. Mr. J. H. Fraser proposed a very cordial vote of thanks to Mr. Kubale for his services as President, and this was seconded by Mr. T. Austin.

Mr. Woodbridge then delivered his inaugural address, on the theme "The Stimulation of Economics." During the second half of the 19th century, he stated, Britain had made considerable progress, mainly in the mechanical and block telegraph field, probably because our grandfathers had inherited the stimulus of the industrial revolution and also had the incentive of great rewards for their inventive genius. In addition, there were a few judicious prods from the governments of those days, administered by means of Acts of Parliament, which necessitated the equipping of the railways with safety appliances at a very great rate. The wave of progress in the railway signalling world, to a great extent, had passed in the early years of this century, leaving only a few ripples which had continued until recently. Two world wars had altered the whole balance of the economy of the country.

After outlining the economic difficulties of the present day, Mr. Woodbridge stressed that British Railways, if they were to survive, must be made to pay their way. The railways had been warned of what might happen to them, if they failed, and at the same time they had been allotted the finances to deal with a large part of the job.

The British railwayman, he went on, for many years, had the reputation of being a man who would give of his best under all conditions; he was reliable and, in many ways, progressive in his outlook. Over the past 40 years, his job has been submitted to intensive economic and political campaigns, which had gradually sapped the vitality of the system and produced a considerable amount of unjustifiable adverse publicity. Through it all, however, the real railwayman had kept going under conditions which had been very disturbing. He had not let the railways or the country down. The equipment he had had to use was very old-fashioned and in need of modernisation; most of his work was still being done in "1890 fashion." For the first time for over half-a-century, something big was to be accomplished.

### Signal Engineers on British Railways

As to the position today of railway signal engineers employed by the B.T.C., for the first time in the history of any railway in Great Britain, it was widely realised outside the profession that the signal engineer had a very great contribution to make towards the well-being of British Railways. If signal engineers worked hard now and produced the results which they knew to be possible, their influence on progress would be very great. There was, however, a handicap in the cost of the jobs that were proposed. In no circumstances must they take the line that signalling was, in any case, a small charge as compared with the cost, say, of electrification. It could often be found that signalling costs at a particular place equalled, or exceeded, those of the civil engineer, even though the latter was involved in a huge rebuilding of a station, offices, and permanent way. There, then, was both a challenge and a stimulus to the railway signal engineer, who must reconsider his methods, review his practices and build up his staff to enable it to be done. That had to be done quickly; otherwise the allocation of money would be spent on too few jobs. They could be helped in the reduction of costs by their suppliers, for whom it was a chance to produce new ideas and equipment.

### Basic Economies in Signalling

The work of the signal engineer was based on a sound knowledge of railway working and an innate ingenuity for solving railway problems, matched with an extensive technical training. Given a certain form of traction, the signal engineer could design a signalling scheme on sound engineering principles, provided he knew sufficient about the traffic to be moved. What was difficult to assess was the basic economies of a scheme, as there were so many factors to take into account. Probably one of the lesser known approaches to the subject was that of Lomonosoff, who produced a complex formula for the cost of a net ton-mile. Using a lantern slide, Mr. Woodbridge reviewed the various

factors in the formula which affected the signal engineer, saying that he regarded the formula as a very good guide to possible ways and means for developing the application of scientific signalling principles to a section of line.

Continuing, he stated that, on the technical side of the signal engineer's job, what was wanted was an installation which was safe, so cheap that a case could always be made for it, modern and up to date, in adequate supply, and easily and cheaply maintained. He suggested also that it should not be made to last too long. In the technical field, the railway signal engineer could take the initiative, if he so desired. With regard to design, where relays were concerned, it was time to revise ideas considerably, when the developments that had taken place in aircraft electrical equipment were seen. On the question of equipment standards, the railways developed very elaborate systems for overhauling equipment of a vintage of 20 or more years old, because there was no better or cheaper new standard to adopt. In consequence, one had to decide to overhaul relays or a point machine at a fraction of the cost of new, because it was cheaper to do so and there was no economic case for adopting a new article. That must surely be the wrong approach. Why not consider that equipment should not last longer than, say, 20 years, and design accordingly?

### "Foreseeable" Difficulties

In Britain they were inclined to play for safety in most of what was done. The signal engineer liked to feel that most foreseeable defects had been eliminated before a system was put into use. It was in the interpretation of the word "foreseeable" that one could get into difficulties—there were so many people who tried to foresee difficulties where none existed. Signal engineers who, after all, dealt with human freight, were inclined, in all the circumstances, to proceed with the utmost caution and tended to fall into that error more easily than most people. There was no reason to doubt, however, the experience of other countries and an examination could be made of different lines of approach. The Swiss and German approach to signalling in recent years had shown great initiative and reliability. Mr. Woodbridge felt that the new forms of circuit design were the main feature on which to concentrate. The "packaged circuit" system of Switzerland and Germany undoubtedly showed great promise and enabled most installation work to be prefabricated.

Two items had caused British signalling to incur considerable costs which did not arise in countries not influenced by British practice. In the case of the first, which was imposed on the railways by law, namely, the level crossing gate, considerable relaxation had now been given. The second item was the overlap, imposed by regulation, and this had been reduced from 440 yards under block telegraph working to 200 yards under multiple-aspect signalling. British Railways were now fitting all vehicles with continuous automatic brakes, and main lines with automatic train control and multi-aspect signalling. Was there any good reason for keeping overlaps under those conditions of operating, when no other country did so?

Mr. Woodbridge then went on to the subject of work study and, in his concluding remarks, considered that there must be a great field for the application of work study principles to all people engaged on signalling work, both those employed by the railways and the suppliers.

## Minister Thanks B.T.C. for Help During Petrol Rationing

Mr. Harold Watkinson, Minister of Transport & Civil Aviation, has written to Sir Brian Robertson, Chairman of the British Transport Commission, thanking him and the staffs of British Railways, London Transport, British Road Services, and British Transport Waterways for the manner in which they responded to the demands made upon them during the period of petrol rationing.

Of British Railways the Minister has stated:

"I know these demands have not always been easy to meet. At the peak of the emergency in February you succeeded in carrying passenger and freight traffic worth 20 per cent and 15 per cent more than a year previously. This is a very considerable achievement on which all concerned richly deserve congratulation. The railways' efforts have made a material contribution to our success in overcoming the many difficulties with which the closing of the Suez Canal confronted us, and to our relative freedom from hurt by it.

"It will be some time before we can assess the long-term effect of the experience of the last few months on the railways. But I am sure that the goodwill they have won during the emergency will, with the promise of increasing efficiency, stand them in good stead for the future and help them through the difficult years that must elapse before the modernisation programme begins to have its full effect on railway traffic.

"It is good to be able to say once again 'Well done, railwaymen'."

## Brush Locomotives at Margam Steelworks

The opportunity to see the diesel-electric shunting locomotives operating at the Margam (Port Talbot) works of the Steel Company of Wales Limited was given to representatives of the technical Press on May 15.

The Steel Company of Wales Limited is the largest private owner of diesel-electric locomotives in Britain; the object of the visit was to observe the day-to-day operation of these units. The numbers of each type of motive power operated by the company are 16 steam, four diesel-mechanical, and 29 diesel-electric locomotives. Of the latter, Brush Traction Limited have supplied 24 units ranging from 42-ton 0-4-0 300-b.h.p. to 72-ton Bo-Bo 515-b.h.p. units. The largest locomotives at present used by the company are five 660-b.h.p. Bo-Bo, built by Alco and acquired in 1950; but to these will be added shortly three Brush Traction Limited 88-ton machines of the same power and wheel arrangement, which, it is claimed, will be the most powerful diesel-electric shunters to have been built in this country.

Typical duties of the Brush-built locomotives include shunting by the "500" class 300-b.h.p. units in the formation of 720-ton trains conveying steel coil to the Trostre Tinplate Works; haulage by the "700" class 480-b.h.p. locomotives of ingot trains of 900 tons weight, within the works premises, from the furnaces to the re-heating plant; and the handling by the "700" class of seven loaded slag pots from the blast furnace, which gives a gross train weight of 500 tons, which are propelled up a 1 in 70 gradient to the tipping point. In addition, the three

"900" class locomotives, with 515-b.h.p. engines, deal with similar traffic to the "700" class, but can, of course, move heavier loads, in the case of slag traffic handling nine full slag pots, of up to 650 tons gross.

The diesel units maintenance shed was also inspected; this has many features which have proved of assistance in improving output, both in quality and quantity. They include three working

levels—a platform at engine bed level, floor level for brake block inspection, and a well-lit, tiled, deep inspection pit between rails.

It is intended that, in the near future, Margam and Port Talbot will be completely converted from steam to diesel locomotive operation, but this is being delayed until all the stock required is available, so as to reduce overlapping to a minimum during the changeover period.

## Beyer, Peacock & Co. Ltd.

*Strong and liquid position: Mr. Harold Wilmot on widespread activities*

The annual general meeting of Beyer, Peacock & Co. Ltd. was held on May 21 in London, Mr. Harold Wilmot, C.B.E., Chairman & Managing Director, presiding.

The following is an extract from the Chairman's circulated Review:—

The accounts continue to show a strong and liquid position with revenue reserves further increased.

Trading conditions were not easy. For example, in December, 1955, we secured an important locomotive order from the South African Railways administration for 35 powerful Beyer-Garratt locomotives. An essential condition of the contract was a delivery commencing in seven months. On the face of it this seemed impossible. Only by straining to the utmost our friendly relationship with suppliers and by the adoption of unconventional methods in the manufacture of certain essential components were we able to meet our obligations. The first locomotive was in steam and under test at our Manchester factory one month before contract date and we were happy to have the General Manager of the South African Railways & Harbours at Manchester to witness that achievement. We are most grateful to all who contributed towards the success of that exceptional exercise. This is a small example of what can be done in the export field when men of goodwill co-operate in a determination to achieve the apparently impossible.

For many years the delivery record of your company has been almost free from blemish. It is good to record this—especially in view of public comment which has often been critical of British exporters in this respect. Shareholders will appreciate that efforts such as the one described are, however, costly and the direct profits from this contract naturally suffered somewhat as a result. Nevertheless, I believe that in relation to the goodwill maintained and strengthened the cost was relatively trivial.

### Trading Activities

The results of the year are on the whole fairly satisfactory. Such small decline as there was is likely to be recovered in the current year.

Metropolitan - Vickers—Beyer, Peacock Limited (Diesel Electric & Electric Locomotives) continued to make satisfactory profits and have a reasonable forward order book.

Our subsidiary companies have been somewhat re-organised for greater convenience of control. Some new models have been introduced and indications are that they will sell well in normal trading periods.

There are indications that subject to no further industrial or political disturbance

our factories will be operating at satisfactory levels throughout 1957. Profit margins should also be reasonable.

Your board consider it is desirable that the ordinary capital of your company should be made transferable in units of 5s. so as to increase its marketability. The preference capital of the company will continue to be transferable in £1 units.

The report and accounts were adopted and the proposed final dividend of 6 per cent, plus a bonus of 6 per cent, making 16 per cent, less income tax, for the year was approved.

## Glasgow-Fife Train Service

The future transfer of all Scottish passenger services running from and to Queen Street Station, Glasgow, to Buchanan Street, which latter is to be enlarged and eventually to become the only terminus on the north side of the city, is foreshadowed by some considerable improvements to the service between Glasgow and Fife that came into operation on May 6. Additional trains have been introduced, from Buchanan Street at 9.40 a.m. to Kirkcaldy, 11.35 a.m. to Kirkcaldy and Leven, 2.20 p.m. to Kirkcaldy and Thornton, 6.40 p.m. to Dunfermline and Thornton, and 9 p.m. to Kirkcaldy and Ladybank, all calling at Falkirk Grahamston and Inverkeithing. In the reverse direction, new trains are running at 6.50 a.m. and 1.25 p.m. from Markinch, 8.45 a.m. from Leven, 12.5 p.m. from Kirkcaldy, and 3.59 p.m. from Thornton, the first three via Kirkcaldy and the last via Dunfermline, to Inverkeithing, Falkirk Grahamston, and Buchanan Street. Certain other intermediate stations are being served, and connections are given at Kirkcaldy with Edinburgh-Dundee-Arbroath-Montrose trains.

### Transferred Services

In addition, the 8.45 a.m., 12.50, 4.7, and 5.15 p.m. trains from Queen Street to Fife are transferred to Buchanan Street, and similarly the 7.30 and 10.46 a.m. and 7.47 p.m. from Thornton, the 7.34 a.m. from Dundee via Craik and the 2.30 p.m. from Craik to Glasgow. Falkirk and the adjacent town of Grangemouth will be among the principal beneficiaries of these changes, not merely because of the considerable amplification of the service, but also because the Grahamston station is in the centre of the town, as compared with Falkirk High, on the Glasgow-Edinburgh main line, previously used by Glasgow-Fife trains, which is well out of it. For this reason the Sunday services between Edinburgh Waverley and Glasgow Queen Street that stop at Falkirk are diverted through Grahamston.



## Questions in Parliament

### B.T.C. Report for 1956

Mr. David Jones (The Hartlepoons—Lab.) asked the Minister of Transport & Civil Aviation on May 8 when he expected to receive the 1956 Report of the British Transport Commission.

Mr. Harold Watkinson: About the end of June.

### B.T.C. Channel Tunnel Shares

Mr. E. du Cann (Taunton—C.) asked the Minister of Transport & Civil Aviation on May 15 what direction he had given to the B.T.C. under Section 92 (2) (b) of the Transport Act, 1947, regarding its holding in the general reserve of shares in the Channel Tunnel Co. Ltd. Mr. Harold Watkinson, in a written reply: None.

### Euston-Glasgow Electrification

Mr. Kenneth Robinson (St. Pancras N.—Lab.) asked the Minister of Transport & Civil Aviation on May 15 when the electrification of the Euston-Glasgow main line would commence; which section would be taken first; and when it was expected that the Euston-Rugby section would be completed.

Mr. Harold Watkinson: The pilot section in Lancashire and Cheshire should be in operation by the middle of 1958, but it is not possible at this stage to say when the section of the line from Euston to Rugby will be ready. It is hoped that the whole line from Euston to Manchester and Liverpool will be completed by 1967.

Mr. Robinson asked whether the Minister would do his best to speed up matters.

Mr. Watkinson said the B.T.C. was doing all it could. The Euston-Rugby section would be ready a long time before the whole line was completed.

Mr. E. Popplewell (Newcastle-upon-Tyne W.—Lab.): Will the Minister confirm that the progress being made with the modernisation plan is well up to expectations? I believe that it is, but I should like confirmation. It is a tremendous task.

Mr. Watkinson: It is a tremendous task, and it is actually ahead of schedule.

## Staff and Labour Matters

### Engineering and Shipbuilding Pay

Leaders of the C.S.E.U., at a meeting on May 20, decided to accept the offer of the engineering employers for a pay increase including a year's standstill on pay claims, subject to any improvements which the union representatives could obtain when negotiations were resumed on May 23.

In effect this means that an agreement is likely to be reached under which skilled men will receive an increase of 11s. per week, 10s. per week for semi-skilled grades and 9s. for unskilled grades.

So far as shipbuilding workers are concerned, no settlement has yet been reached. The employers have offered an increase of 11s. with a standstill on pay claims or an increase of 8s. 6d. without any "strings" attached to it.

LANCASHIRE DYNAMO HOLDINGS LIMITED.—A final dividend of 7 per cent has been recommended by Lancashire Dynamo Holdings Limited, making a total ordinary dividend of 11 per cent less tax, for the year ended December 31, 1956. The net profit of the Group for the year, before taxation, amounted to £620,387 (£584,554).

## Contracts and Tenders

### Diesel locomotives for industry at home and overseas

In addition to the 16 diesel shunting locomotives for British Railways reported last week, Andrew Barclay Sons & Co. Ltd. has received orders for four locomotives for the Central Electricity Authority. Those for the C.E.A. will have Rolls-Royce engines of 302 h.p.

Krauss-Maffei A.G., of Munich, has received from the Iron & Steel Corporation of South Africa (Iscon) an order for 20 heavy diesel-hydraulic shunting locomotives with Maybach engine and transmission equipment.

The National Gas & Oil Engine Co. Ltd., of Ashton-under-Lyne has received two recent orders from Pakistan and Iran. The first is for two Naional B2AUP6 type, six-cylinder, pressure-charged, dual-fuel engines each developing 1,460 b.h.p. at 333 r.p.m., and each driving a Brush 1,000-kW., 3.3-kV., three-phase, 50-cycle alternator. They are for the Moghalpura power station of the North Western Railway and will replace two existing engines. Delivery is due in November, 1957. The second order is for two B4AU8 type, eight-cylinder, pressure-charged engines with a continuous site rating of 1,870 b.h.p. at 333 r.p.m. and a one-hr. rating (site) of 2,051 b.h.p. at 333 r.p.m. Each engine is coupled to a Brush 1,310-kW., 6.6-kV., three-phase, 50-cycle alternator. These units are due for delivery to Sherkate Sahami Elektriki Fierouz of Teheran, in September, 1957.

The contract for the dismantling and removal of the Liverpool Overhead Railway has been awarded to George Cohen Sons & Co. Ltd. Because of the amount of material to be dismantled and the many complexities involved, the company is being allowed up to two years in which to complete the contract. It is understood that there are some 25,000 tons of ferrous material involved and most of it will be sent to the furnaces as scrap material.

Malayan Railways have placed a repeat order with Leyland Motors Limited, for 11 Scammell Scarab mechanical horse units and 29 automatic-coupling semi-trailers, to work the docks at Penang and Port Swettenham. The units are six-ton three-wheelers with 52-h.p. engines, the driver's cab being of bolted construction. The 15-ft. trailers are of six-ton capacity and will be supplied without the platform bodies, which will be fitted locally.

British Transport Waterways have placed a contract with Thames Launch Works Limited, Twickenham, for the construction of six welded steel butty boats for the South Eastern Division.

British Railways, Eastern Region, have placed the following contracts:—

C. H. Chaston Limited, Clacton-on-Sea: alterations and additions at Clacton Motive Power Depot

Young, Austen & Young Limited, London, W.C.1: supply, delivery and installation of extension to heating system in carriage lifting shop at carriage & wagon works, Stratford

W. & C. French Limited, Essex: work in connection with protection of foundations and abutments of underline bridge No. 278 over Newark Dyke between Newark and Carlton-on-Trent, and reconstruction of superstructures

of four overbridges Nos. 1006, 1014, 1015 and 1023 between Colchester (St. Botolph's) and Weeley stations

Bernard Pumfrey Limited, Scunthorpe: repairs to inspection pits Nos. 3, 7 and 8 and pavings between pits 3 and 4, 6 and 7, and 7 and 8 and other works in locomotive shed at Doncaster Carr Motive Power Depot

The Reliance Telephone Co. Ltd., London, W.C.2: supply, delivery and installation of 1,000-line private automatic branch exchange at Gt. Northern House, 79/81, Euston Road, N.W.1

Lansing Bagnall Limited, Basingstoke, Hampshire: supply and delivery of 12 diesel industrial tractors for Doncaster Locomotive Works

Samuel Butler & Co. Ltd., Stanningley, Nr. Leeds: reconstruction of portion of flooring and general repair of underline bridge No. 92 over River Trent between Fledborough (Goods) and Clifton-on-Trent (Goods)

James Kilpatrick & Son Ltd., Westminster, London, S.W.1: supply, delivery and erection of electrical installation at Bishopsgate Goods Depot

Metropolitan-Vickers-G.R.S. Limited, London, W.C.2: conversion of signalling equipment to operate in conjunction with 50 c.p.s. traction current, Bethnal Green-Maryland (both exclusive), and Gidea Park-Shenfield

A.I. Electric Welding Machines Limited, London, S.W.1: supply and delivery of automatic flash butt welding machine for Temple Mills Wagon Works

Joseph Westwood & Co. Ltd., Millwall, London, E.14: reconstruction of superstructures of underline bridges Nos. 586, 587, and 588 between Stepney (East) and Bow Road.

British Railways, London Midland Region, have placed the following contracts:

Eagre Construction Co. Ltd., Scunthorpe, Lincs: removal of track and structures, etc., Holywell Branch

Demolition & Construction Co. Ltd., London, S.W.1: demolition work to the over-all station roof, screens and boundary walls, Citadel Station, Carlisle

A. J. Binns (Northern) Limited, Liverpool, 3: 1957 fencing programme, Liverpool district

Brightside Foundry & Engineering Co. Ltd., Newcastle-on-Tyne, 2: heating and ventilation, District Engineers workshop, Barrow Low Yard

Thos. Collier & Sons Ltd., Leigh, Lancs: diesel oil fuelling plant, Speke Motive Power Depot

Arundel (Contractors) Ltd., Bradford: lump-sum contract for labour, cleaning and painting, Wigan N.W. Passenger Station

John Bowen & Sons Ltd., Balsall Heath, Birmingham, 12: motor room and shaft to goods lift, Monument Lane Goods Depot, Birmingham

John Gill Contractors Ltd., London, S.W.1: piling reconstruction bridge No. 1, Bidston North Wales & Liverpool line

Arundel (Contractors) Limited, Bradford: lump-sum contract for labour only, cleaning and painting, Rochdale Passenger Station

The Turnerised Roofing Co. Ltd., London, S.E.11: repairs to roof of carriage shed, Longsight

Taylor Woodrow (Building Exports)

Limited, London, W.1: provision of new small parts store, motive power depot, Castleton

G. F. Tomlinson & Sons Ltd., Derby: renewal of pits and paving, carriage shed, Birmingham Vauxhall

Mechanised Contractors (London) Limited, London, W.5: formation renewal and drainage up and down fast lines 71 m. 1,709 yd. to 72 m. 170 yd., Kettering

L. Fairclough Limited, Adlington, Lancs: temporary steelwork, proposed bridge at Aston by Stone, Macclesfield-Colwich line

Brightside Heating & Engineering Co. Ltd., Birmingham, 3: heating and hot water services, new staff amenity block, Vauxhall Carriage Shed, Birmingham.

British Railways, North Eastern Region, have placed the following contracts:—

Dowsett Engineering Construction Limited, Gateshead: redecking and strengthening, West Blyth Staiths

Pye Telecommunications Limited, Cambridge: V.H.F. radio equipment

Wellerman Bros. Limited, Sheffield: reconstruction of superstructure, bridge 2A near Shaftholme Junction

Wellerman Bros. Limited, Sheffield: reconstruction of bridge No. 39, Seaton Delaval

Tarslag Limited, Stockton-on-Tees: main stores, Thornaby New Motive Power Depot

Walter Kidde Co. Ltd., Greenford, Middx.: fire extinguishing equipment, Newcastle Orchard Street Substation

Holden & Hunt Limited, Old Hill, Staffs: flash butt welding machine, York Wagon Works

W. & J. R. Watson, Edinburgh: construction of carriage washing and standing sheds, Newcastle

Dow-Mac (Products) Limited, Stamford: supply of prestressed concrete trough units.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from Portuguese East Africa for points, switchstands, levers, galvanised rail spikes, fishplates and frogs, rail bolts and spring washers.

The issuing authority is the Beira Railways. The tender No. is A/CFB/11-125/57. Provisional deposits must be made by tenderers of Esc. 80,000 for points, switchstands and levers; Esc. 40,000 for galvanised rail spikes, fishplates and frogs; and Esc. 30,000 for rail bolts and spring washers. The closing date is June 28, 1957. Specifications and drawings are obtainable from the Railway Warehouses at Lourenço Marques through the local agents of United Kingdom firms interested. United Kingdom firms are reminded that they cannot submit tenders direct but only through firms established in Mozambique whose names are registered with the Stores Department of the Treasury (Almoxarifado de Fazenda), Lourenço Marques. The Branch (Lacon House, Theobalds Road, W.C.1.) will, on request, supply the names of local concerns who have expressed their willingness to act on behalf of United Kingdom firms. The reference ESB/11210/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, reports a call from South Africa for a large quantity of narrow-gauge bogie wagons and separate components. Tender forms and relevant drawings can only be obtained from the Chief Stores Superintendent, South African Railways, P.O.

Box 8617, Johannesburg, on a deposit of £50 for the documents and £50 for the drawings. A copy of the tender forms and relevant drawings is available for inspection at the Office of the High Commissioner for the Union of South Africa, South Africa House, Trafalgar Square, London, W.C.2. The closing date for the receipt of bids is July 26, 1957. No further information about this call for tenders is available in the Branch. The reference ESB/12070/57 should be quoted in any correspondence with the Branch (Lacon House, Theobalds Road, W.C.1.)

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for diploires for broad and metre gauge railways as follows:—

22 diploires, 15-ton capacity, consisting of two units, each unit of four wheels, each of the four wheels of the front unit to be fitted with a brake which will be operated by a lever; suitable for 5-ft. 6-in. gauge, similar to type V-134 diploire

9 material lorries, 15-ton capacity, consisting of two units, each unit of four wheels, the four wheels of front unit to be fitted with brakes, which are to be operated by lever, or hand crank suitable for 3 ft. 3½ in. (M.G.), similar to diploire type V-134. (Ref. No. B/Ns.)

The issuing authority is the Director General of Supplies & Disposals. The tender No. is P/SRI/18662-G/I. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is May 31, 1957. A set of tender documents is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.) A photo-copy set can be purchased from the Branch for 13s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The reference ESB/12087/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for superheater elements as follows:

200 superheater elements, sterling type, complete with clamps, etc., first row, for YP class loco. to drg. No. ESL/216-94 (D.G.S.&D. No. 12196) I.R.S. specn. No. R32/54 & R23/51

160 superheater elements, sterling type, complete with clamps, etc., fourth row, for YP class locos, to drg. No. ESL/216/94 (D.G.S.&D. No. 12196) I.R.S. specn. No. R32/54 & R23/51

9 superheater element tubes, M/A second row, complete with bands, etc., APCI, PC1, PC2 (Ex. E.I.R.) classes of engines to cons. engr. drg. No. E11098/37 (I.S.D. No. 4759)

9 superheater element tubes, M/A first row, complete with bands, etc., for GCI & GC class of engines (Ex. E.I.R.) to Ex. E.I.R. part No. SX 312 on cons. engr. drg. No. E11099/40 (I.S.D. No. 4760/1)

24 superheater element pipes, middle row, complete to R.P.&T. drg. No. E/SL-304/46 (D.G.S.&D. No. 13625), item B for ZE I.R.S. specn. No. R32/54 and 23/51, ball end should be perfectly to the drg. and highly finished

24 superheater element pipes, bottom row, complete to R.P.&T. drg. No. E/SL-304/46 (D.G.S.&D. No. 13625), item C for ZE class

24 superheater element pipes, top row, complete to R.P.&T. drg. No. E/SL-304/46 (D.G.S.&D. No. 13625), item A for ZE class

20 superheater element steel tubes, sterling type, third row, complete with bands, supports, clamps and clamp washers for E/1 class to cons. engr. (R.W.&P.) drg. No. 23237/46 (I.S.D. No. 4778), mark No. 3, I.R.S. specn. No. R-32/54 and R-23/51.

The issuing authority is the Director-General of Supplies and Disposals. The tender No. is P/SW2/18033-H/1. Bids should be sent to the Director-General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is May 28, 1957. A set of tender documents, excluding specifications and drawings, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.) A photo-copy set can be purchased from the Branch for 13s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The attention of United Kingdom firms is drawn to a booklet issued by the Government of India entitled "Conditions of Contract Governing Department of Supply Contracts," a copy of which is available for inspection at this Branch. The reference ESB/11593/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for point control equipment as follows:—

75 switch and lock movement "D" drilled to suit mechanical detection, complete with all parts as shown on the drawing, W. Rly. drg. DCES/1087 (D.G.S. & D. No. 12917) & DCES/1539-1539A (I.S.D. No. 12461/1) I.R.S. specn. S-10-56 & B.1.10 I.S.I. specn. No. 210 grade 14 for base

666 standard "E" type lock, with key (key ward to be specified afterwards) I.R.S. (S) SA-3376 alt. nil (advance) and I.R.S. specn. No. S-10-56

666 bracket for fixing "E" type lock to lever to drg. No. DCES-2297 (D.G.S. & D. No. 12916) cast-iron to I.S. 210 grade 12.

The issuing authority is the Director-General of Supplies and Disposals. The tender No. is SRIA/18507-G/V(B). Bids should be sent to the Director-General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is May 28, 1957. A set of the tender documents, but not specifications and drawings, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.) A photo-copy set can be purchased from the Branch for 17s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The attention of United Kingdom firms is drawn to a booklet issued by the Government of India entitled "Conditions of Contract Governing Department of Supply Contracts," a copy of which is available for inspection at the Branch. The reference ESB/11539/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of

Trade, has received a call from India for signal equipment as follows:—

50 double wire compensators, type "A" for detectors up to 550 yd. (with rechet rod S.7346A) to I.R.S. drg. SA 7304 advance and C.S.O. catalogue No. 133

1,140 double rotary detectors for push pull signal transmission detector "N" pull (1) "R" pull (2) to I.R.S. drg. No. SA 7504 advance C.S.O. catalogue No. 148.

The issuing authority is the Director General of Supplies and Disposals. The tender No. is SR2/18088-G/III. Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is May 28, 1957. A set of tender documents, excluding specifications and drawings, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.). A photo-copy set can be purchased from the Branch for 16s. Cheques and postal orders should be made payable to the principal accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The reference ESB/11536/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for narrow gauge lever boxes, as follows:—

72 lever boxes N.G. to C.E. KDC drg. No. NGM/3 NGM/3-2 to 7 (D.G.S. Nos. 407 D.G.S.D. No. 12237 to 12242 without connecting rod and H.D. bolts and to I.R.S. specn. No. 5-10/53. Corr. and add No. 1 of 5/5 and C-1-base forms to I.S.-210 grade 12).

The Issuing Authority is the Director General of Supplies and Disposals. The tender No. is SR2/18108-G/III. Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is May 30, 1957. A set of tender documents, excluding specifications and drawings, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.). A photo-copy set can be purchased from the Branch for 17s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The reference ESB/11594/57 should be quoted in any correspondence with the Branch.

## Notes and News

**Indian State Railways Annual Reunion Dinner.**—The annual dinner of the Indian State Railways will be held at the Rembrandt Hotel, Thurloe Place, S.W.7, on June 3, at 7 for 7.30 p.m.

**B.T.C. Work Study Training Centre.**—In the article dealing with the B.T.C. Work Study Training Centre at Watford on page 578 of our issue of May 17, we referred to the British Transport Commission as having "a staff of over 80,000." This figure should have read "800,000."

**University of Birmingham Department of Extra-mural Studies: Course on Canal & Railway History.**—A residential course on Canal & Railway History is to be held at Preston Montford, near Shrewsbury, from July 13 to 20. Enquiries should be made to the Director of Extra-mural Studies, The University, Edmund Street, Birmingham, 3.

**Japanese Express Derailed on Bridge.**—A report from Tokyo states that three people were killed and 28 injured when an express train from Tokyo to Aomori, the Honshu terminus of the ferry route to Hakodate, in Hokkaido, was derailed on a bridge in northern Honshu. The rails had been damaged by a derailed wagon and when the passenger train ran off the rails three of the coaches fell from the bridge.

**Concession to "C" Licence Holders Withdrawn.**—The Licensing Authorities for Goods Vehicles have informed the Minister of Transport & Civil Aviation that the authority which they granted during petrol rationing to the holders of "C" licences in certain circumstances to carry in their vehicles goods belonging to another "C" licence holder expired on May 15. Holders of "C" licences may now use their vehicles only to carry goods for or in connection with their own trade or business and not for hire or reward.

**B.T.C. Canal Cruise Boat.**—British Transport Waterways is to run a series of canal cruises this summer as part of a plan to develop pleasure boating on its canals and inland waterways. The first cruise, a five-day voyage between Oxford and Birmingham, on the Oxford and Grand Union Canals, will start from Oxford on June 3 in the motor boat *Water Rambler*, shown in the accompanying illustration, a canal narrow-boat specially converted and

appointed for luxury cruising at a cost of more than £5,000. The boat, 71 ft. long and 7-ft. beam, has a comfortable observation cabin with accommodation for 20 paying passengers, galley, luggage locker, toilet, and quarters for the two crew. The tourists will spend their nights at hotels en route. The work of reconstructing the *Water Rambler* was carried out at the Twickenham yards of Thames Launches, Limited, London.

**Prototype Coaches in Service.**—Two prototype coaches built by the Metropolitan-Cammell Carriage & Wagon Co. Ltd. are in service in the "Royal Scot." Passengers are being asked to give their opinion of the coaches and British Railways will take their comments into consideration when designing new hauled stock. The coaches were described in our issue of February 8 last.

**British Railways at Cardiff Careers Exhibition.**—A Careers Exhibition Week, in which the Western Region of British Railways participated, was held at Cardiff recently. This was the third annual exhibition of its kind to be held at Cardiff and was generally acknowledged to be most successful. Some 4,000 senior schoolchildren visited the exhibition in organised parties. The total attendance was estimated at 12,000 and much interest was shown in the British Railways stand, the central feature of which was the working model of a modern colour-light signalling lay-out. This model was constructed at the Reading Signal Works and had been previously on exhibition in London and Glasgow. On the first day of the exhibition a visit was paid to the stand by the Lord Lieutenant of the County of Glamorgan and the Lord Mayor of Cardiff. They were met on arrival at the stand by Mr. W. R. Stevens, South Wales Area Officer, Western Region. At the opening ceremony on April 3, the speaker was Mr. Anthony Berry, a Member of the Western Area Board.

**North British Locomotive Order.**—As announced in our Contracts and Tenders section last week, the British Transport Commission has ordered 25 diesel-hydraulic shunting locomotives from the North British Locomotive Co. Ltd. This order, with previous orders from the Commission, provides continuity of work in these shops for the future. These 25 shunters are to be powered by an N.B.L./M.A.N. diesel engine of 225 h.p. and are fitted with the Voith/North British hydraulic transmission, both of these being



British Transport Waterways canal cruise boat "Water Rambler"



made in the company's Glasgow factories. The North British Locomotive Co. Ltd. has now supplied or has on order more than 60 of this particular size of standard design and this is a repeat order of the same size of locomotive for the Commission. The shunters are intended for use on the Scottish Region.

**British Railways Cartage Surcharge Withdrawn.**—The British Transport Commission has announced withdrawal as from May 20 of the surcharge of 6d. a ton on British Railways cartage charges, which was added last December when the cost of petrol and fuel oil was increased.

**North Eastern Area Board in the West Riding.**—Mr. T. H. Summerson, Chairman, and Members of the North Eastern Area Board, with Mr. H. A. Short, General Manager, North Eastern Region of British Railways, and departmental officers, last week visited installations in the West Riding of Yorkshire. At various places on their tour they were met by local railway officials and took the opportunity of meeting members of the staff.

**Motor Repair Depot Opened at Kings Cross.**—British Railways, Eastern Region, have opened a new depot at Battlebridge Road, Kings Cross, London, for the maintenance of some 400 road motors and 750 trailers used on collection and delivery services and also other mobile equipment. The new depot, with an unrestricted floor area of some 20,000 sq. ft., replaces one seriously damaged by enemy action during the war. The building provides for present needs and will be able to accommodate any further expansion of the Kings Cross cartage fleet.

**Paxman Diesel Spares in Venezuela.**—The first British diesel engine manufacturer to establish a realistic spares service independently of users' inventories in Venezuela is Davey, Paxman & Co. Ltd., of Colchester. A full and comprehensive range of spares for Paxman engines is available from the accredited spares agent at Caracas, Petroleum Industry Consultants, C.A., Edificio Luz Electrica, 2° Piso, Avenida Urdaneta, Caracas—Venezuela. Postal address: Apartado 3992. Cables: Peticon-Caracas. Service at Maracaibo is from: Petroleum Industry Consultants, C.A., Apartado 532, Maracaibo, Venezuela. Cables: Peticon-Maracaibo. The Peticon organisation is staffed by experienced personnel and is able to provide all the necessary facilities to give the widest possible coverage and to ensure prompt and efficient spares service throughout the 24 hr. This spares organisation has primarily been established to service Paxman oil well drilling engines but it is ready to meet the needs of all users and prospective users of Paxman engines in Venezuela irrespective of application. The President is Mr. I. B. Allen and Mr. G. M. Davies is Vice-President.

**Conveyance of Motorcars by British Railways.**—The Eastern and North Eastern Regions have announced that a new facility will be introduced on June 17, by which motorcars and drivers will be conveyed between certain selected stations at reduced rates. The stations concerned are Cambridge, Colchester, Darlington, Doncaster, Grantham, Hull, Ipswich, Leeds, Lincoln, Newcastle, Norwich, Peterborough, Sheffield, and York, and the arrangements apply between any pair of these stations, subject to a minimum charge as for 100 miles. The single journey charge for a car and driver travel-

ling second class 100 miles, will be £5, and the return journey charge £9. The motorcars will be conveyed in covered carriage trucks, and as far as possible by the same train as that in which the driver and any other accompanying passengers are travelling.

**London Midland Region (London) Orchestral Society Concert.**—A concert was given by the London Midland Region (London) Orchestral Society (British Railways) at St. Pancras Town Hall on May 16. The orchestra, conducted by John Grindley and led by George Elmitt, gave a popular programme which included "Valse Triste" by Sibelius, "Dance of the Hours" by Ponchielli, and the Grieg piano concerto. The soloist was George Kirby, who showed his technical mastery of his instrument not only in the concerto—the most successful item of the evening—but also in Chopin's "Scherzo in B Flat Minor." The orchestra, which now has nearly 60 players, has reached a high standard for an amateur orchestra and looked and sounded workmanlike in all it did, except for some raggedness at important entries, a fault which can easily be put right. Conductor, leader, soloist, and the players worked together to make an enjoyable evening.

**Omnibus Wage Claims.**—A meeting of the National Council for the Omnibus Industry was held in London on May 10 in relation to the claims of the trade unions for substantial wage increases together with alterations and improvements in working conditions. The trade union claims were referred to a Special Committee in accordance with the provisions of the constitution of the Council. The claims affect some 100,000 workpeople in the provincial bus industry employed by the private bus companies and the British Transport Commission controlled undertakings.

**Alfred Herbert Limited.**—Sir Alfred Herbert, Chairman of Alfred Herbert Limited, machine tool makers, reports that the works were fully employed in every de-

partment during the year ended October 31, 1956, and deliveries during the first four months of the current year have so far exceeded the corresponding figures of a year ago. The companies in Australia, India, France and Italy have done well, and the export business well maintained. The company's machines have been well received in both the United States and Canada. The net profit after tax is £1,947,179 (£1,906,295), and a dividend of 7½ per cent tax free (against 6½ per cent net) is recommended.

**London Bus Operation.**—In a statement last week on the end of petrol rationing, Sir John Elliot, Chairman of London Transport, declared that in the last five months the London buses had been punctual and regular because the streets were free of parked cars and vans. London Transport had developed greatly improved methods of bus control and supervision during the period of fuel rationing in readiness for the time when normal conditions returned, and would concentrate supervision on routes crossing the West End and the City. He urged business men to leave their cars in the station car parks and go on using the Underground, the coaches, and the buses as they had been doing. "I must warn Londoners that if 50,000 cars are left lying about in the streets all day as they were before petrol rationing started," he comments, "then it will be the busman's nightmare, and London's too."

**Park Royal Railbus Order.**—As announced in our Contracts and Tenders columns last week, Park Royal Vehicles Limited has received an order from the British Transport Commission for five lightweight diesel-engined railbuses. Further details issued by the company reveal that these are individual 56-seat vehicles embodying conventional bus constructional features in the body design. To ensure the maximum comfort the complete body is suspended from the four-wheel underframe by means of a four-point suspension system employing coil springs. The vehicles are powered by a B.U.T. 150-h.p.

### Visit to Britain of Indian Railways Director of Research



Photo]

Mr. S. L. Kumar, Director, Research, Indian Railways, who is visiting Europe, at the Western Region concrete depot at Taunton, with Mr. G. F. Tanner, of the District Engineer's staff, Taunton, who is in charge of the depot

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horizontal engine driving through a fluid flywheel and four-speed epicyclic gear box to the final drive unit embodying reduction and forward/reverse gears. They will be fitted with direct air-operated clasp-type brakes and are designed for control from either end and individual operation.

**United Service Transport Co. Ltd.**—The United Service Transport Co. Ltd. has recommended a final dividend of 9½ per cent, making 12½ per cent for the year ended September 30, 1956, on the £227,154 ordinary capital as increased by a one-for-one scrip issue.

## OFFICIAL NOTICES

**REQUIRED** for the Central Railway of Peru. **ASSISTANT MECHANICAL ENGINEER.** To have served mechanical engineering apprenticeship with British Railways, Steam or Diesel Locomotive Manufacturers and be a Graduate of the Institute of Mechanical Engineers, preferably with some railway Workshop experience. Must be physically fit for inspection trips at altitudes of 15,000 ft. Age 23-30 years. Salary—£1,300 per annum plus cost-of-living allowance of approximately 20 per cent. Please apply in writing to: Peruvian Transport Purchasing Company Ltd., "Rex House," 38, King William Street, E.C.4.

**THE NIGERIAN RAILWAY CORPORATION** invites applications for the following posts:—**SIGNAL AND TELEGRAPH WORKS SUPERVISOR.**—Salary, £1,150 by £50 to £1,450 p.a., plus £300 p.a. overseas pay. Candidates must have served full apprenticeship, followed by experience in Railway Signal and Telegraph Workshop, or in established signalling manufacturing concern, and will be required to train and supervise staff in operation of Signal and Telegraph apparatus. Available on pensionable terms or on contract with 20 per cent. gratuity p.a. of total pay.

**SIGNAL INSPECTOR.**—Salary, £700 by £50 to £1,200 p.a., plus £300 p.a. overseas pay. Candidates must have experience in Railway Signalling Department or in Signal Manufacturing concern and will be required to undertake installation and repair of Double Wire Signalling Apparatus. Much time will be spent in the field and conditions are not suitable for a wife. Available on contract terms with 20 per cent. gratuity p.a. of total pay.

**Tours:** 15-month tours followed by 15 weeks' leave in U.K. on full pay. **Allowances:** In addition there are attractive allowances. Applications to: The London Representative, Nigerian Railway Corporation, 11, Manchester Square, London, W.1.

**REQUIRED** for the Central Railway of Peru. **ASSISTANT ELECTRICAL ENGINEERS (DIESEL)** to have served an Electrical Engineering apprenticeship with a reputable firm or railway where Diesel Locomotives were employed, preferably railway company, and be a Graduate of the Institute of Electrical Engineers. Must be physically fit to carry out inspection trips and work periods at altitudes of 15,000 ft. Age 23-30 years. Salary offered, £1,300 per annum plus cost-of-living allowance of approximately 20 per cent. Please apply in writing to: Peruvian Transport Purchasing Company Ltd., "Rex House," 38, King William Street, E.C.4.

**THE NIGERIAN RAILWAY CORPORATION** invites applications for the following posts:—**Salary** scale of both posts £800 by £50 to £1,600 p.a., plus £300 p.a. overseas pay.

**ASSISTANT QUANTITY SURVEYOR.**—Candidates must have 5 years' training in a London Office. A.R.I.C.S. or equivalent with 3 to 5 years' post-qualifying experience desirable. Appointment on contract terms with 20 per cent. gratuity p.a. of total pay.

**ASSISTANT ESTATE AND VALUATION OFFICER.**—Candidates, between 22 and 30 years, must be (a) Corporate Members of Royal Institution of Chartered Surveyors or Chartered Auctioneers' and Estate Agents' Institute or Land Agents' Society or (b) have passed a degree or examination necessary for obtaining Corporate Membership of one of the above Institutions or (c) have a degree in Estate Management—B.A. Cambridge or B.Sc. London.

Appointment on pensionable terms or on contract with 20 per cent. gratuity p.a. of total pay. **Tours:** 15-month tours followed by 15 weeks' leave in U.K. on full pay. **Allowances:** In addition there are attractive allowances. Apply to: The London Representative, Nigerian Railway Corporation, 11, Manchester Square, London, W.1.

**THE NIGERIAN RAILWAY CORPORATION** invites applications for appointment as:—**INTERNAL AUDIT EXAMINER.** Salary, £700 by £50 to £1,200 p.a., plus £300 p.a. overseas pay. Appointment on pensionable terms or on contract with gratuity of 20 per cent. p.a. of total pay. **Qualifications:** Candidates should hold a recognised Accountancy degree or intermediate certificate of a recognised accounting body and not less than five years' practical

auditing experience, or not less than five years' audit experience in a senior capacity. **Tours:** 15-month tours followed by 15 weeks' leave in U.K. **Allowances:** In addition there are attractive allowances. Apply to: The London Representative, Nigerian Railway Corporation, 11, Manchester Square, London, W.1.

**THE NIGERIAN RAILWAY CORPORATION** invites applications for the following posts:—**Salary** of all posts, £700 by £50 to £1,300 p.a., plus £300 p.a. overseas pay. Appointments on pensionable terms or on contract with gratuity of 20 per cent. of total pay p.a.

**DIESEL FOREMAN ELECTRICIAN.**—Candidates must have served a recognised apprenticeship with manufacturer of Electric Traction equipment or with a Railway Electrical Department and have had not less than 5 years' experience in overhaul and operation of Traction Equipment. The person selected will be required to assist in supervision of a Diesel Electric Running Shed.

**PLANT FOREMAN.**—Candidates required with experience of maintenance and overhaul of civil engineering contractors' plant including diesel compressors, diesel and petrol concrete mixers, motor transport lorries, etc.

**DRILLING FOREMAN (RESEARCH).** Selected candidate will be required to carry out field soil sampling work in connection with soil mechanics division of Research Section. Candidates must be capable of operating all drilling and sampling apparatus and have not less than 3 years' experience with a soil sampling drilling unit.

**Tours:** 15-month tours followed by 15 weeks' leave in U.K. on full pay. **Allowances:** In addition, there are attractive allowances. Apply to: The London Representative, Nigerian Railway Corporation, 11, Manchester Square, London, W.1.

**NATIONAL COAL BOARD. DURHAM DIVISION. DIVISIONAL TRANSPORT OFFICER.** Applications are invited for the above post with headquarters in Newcastle-on-Tyne, 1. **Salary Scale:** £1,085 by £35 to £1,475 p.a., according to qualifications and experience. Applicants should have a wide experience of transport organisation. The appointment will involve dealing with problems of rail transport, and the management and supervision of a large road transport organisation. Applications, giving the fullest particulars and quoting reference E.V.233/85, should be submitted within 7 days to Divisional Chief Staff Officer, National Coal Board, Durham Division, 7, Side, Newcastle-on-Tyne, 1.

**SALE OF RAILWAY MATERIAL.**—200 Tons Serviceable 95 lb. B.H. RAILS, chiefly in 60 ft. lengths. 2,500 Relayable S.I. TYPE CHAIRED SLEEPERS. 1,000 Relayable PLAIN SLEEPERS. Relayable CROSSING TIMBERS. Serviceable Turnouts, fastenings, etc., to suit. 300 Tons 60/65 lb. Relayable F.B. RAILS together with complete Turnouts and Crossings, etc. Delivery Ex Stock subject to remaining unsold.—Eagre Construction Co. Ltd., East Common Lane, Scunthorpe. Telephone: 4513/7.

## Railway Stock Market

Stock markets again displayed considerable activity, but profit-taking in industrial shares gave an irregular tendency to prices. There seems little doubt that sentiment has again been affected by the fear that an early reduction in the bank rate is unlikely unless sterling shows sustained strength. British Funds came back sharply with War Loan 3½ per cent down to £69½, its lowest this year; but there was a firmer tendency later in the gilt-edged market. Although they showed some strong features, industrial shares seemed to be affected by the many annual reports, particularly that of Imperial Chemicals, which emphasise that, because of rising costs, expansion in turnover has not been reflected in profits.

Among railway stocks activity continued in Antofagasta on break-up value estimates, which suggest that if ever there were a take-over offer made for the railway, it would have to be on a basis very much in excess of the current market price of the ordinary stock. The latter has risen further from 37½ to 39, the highest this year, but the preference stock at 49½ was fractionally lower on balance. The 5 per cent (Bolivar) debentures gained a point at 92½.

Improvement in San Paulo Railway 3s. units continued and the price strengthened afresh from 3s. 9d. to 4s. Costa Rica ordinary at 25½ strengthened on talk of the possibility of a future scheme of arrangement which would permit payment of regu-

lar dividends. Dorada ordinary stock was again quoted at 58½.

Brazil Railway bonds firmed up to 6½ and International Railway of Central America shares have been marked up from \$37½ to \$45½. Mexican Central "A" bearer debentures were quoted at £70.

Canadian Pacifics, after their recent rise, have eased slightly from \$71½ to \$70½. The preference stock receded from £58½ to £58 and the 4 per cent debentures from £70 to £67½xd. White Pass shares came back from \$25½ to \$24½.

A factor which tended to quieten the market in engineering and kindred shares was the news of important new issues to shareholders and reports of more to come from other companies. Following the Rolls-Royce rights offer, there is news that John Summers are to offer their shareholders 4,500,000 new shares at par (£1 each) in the proportion of one for every two held. The interim dividend was already being maintained at 4 per cent and the directors expect at least to keep the final dividend at 8 per cent on the larger capital. The existing shares are quoted at 34s. 6d. and other steel shares also eased a few pence.

Beyer Peacock at 44s. were within 3d. of the level a week ago. G. D. Peters were well maintained at 30s. and Charles Roberts 5s. shares have risen on balance from 11s. 3d. to 16s. 10½d. Wagon Repairs 5s. shares were firm at 14s. 4½d. and Gloucester Wagon held last week's rise to 13s. 9d. Westinghouse Brake were firm at 40s. 9d. North British Locomotive at 18s. 6d. have been quite well maintained but Birmingham Wagon eased from 18s. to 17s. 7½d.

Associated Electrical came back from 68s. 3d. to 67s. 3d. and General Electric eased to 58s. while English Electric were 58s. 9d. xd. There was further demand for T. W. Ward shares, which at 82s. 6d. gained another 1s. 3d., while George Cohen 5s. shares have been firm at 13s. 7½d., Ruston & Hornsby moved slightly higher at 32s. 6d. and Vickers have rallied to 44s. on further consideration of the report and accounts. F. Perkins 10s. shares have been well maintained at 16s. and the 10s. shares of the Dowty Group held firm at 37s. British Timkin at 58s. 6d. have been well maintained. Speculative activity increased in the 4s. shares of the Channel Tunnel Co. and after reaching 29s. 3d. came back in active dealings to 26s. 3d. A week ago the price was 13s. 9d.

## Forthcoming Meetings

Open currently and until further notice.—**British Transport Commission:** Historical Exhibition "Transport Treasures" in Shareholders' Meeting Room, Euston Station, from 10 a.m. to 6 p.m. on weekdays, and 2 to 6 p.m. on Sundays. Admission 6d.

May 31 (Fri.)—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Paper on "Some railway aspects of railway colour photography," by Mr. R. E. Vincent.

June 1 (Sat.) to June 6 (Thu.)—Permanent Way Institution. Annual Summer Convention at Morecambe, Lancs.

June 3 (Mon.)—Indian State Railways, at the Rembrandt Hotel, Thurloe Place, S.W.7, at 7 for 7.30 p.m. Annual reunion dinner, preceded at the same place by a tea at 4 to 6.30 p.m., for officers and/or their wives.

June 6 (Thu.)—The Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "Those were the days," by Mr. Frank Shaw.

